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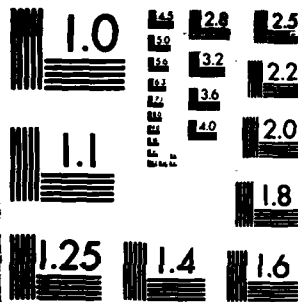
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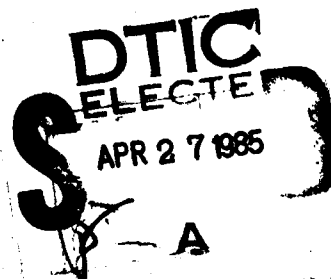


DAJA 45-82-C-0004

Analysis of Environmental Terrain Data

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ANALYSIS OF
ENVIRONMENTAL TERRAIN DATA

Final Technical Report

by

P. Jessl

W. Köppel

December 1983

United States Army
EUROPEAN RESEARCH OFFICE OF THE U.S. ARMY
London, England

Contract Number: DAJA 45-82-C-0004

Battelle-Institut e.V., Frankfurt am Main,
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FOREWORD

The study reported herein was conducted by Battelle-Institut e.V. (BIEV), Frankfurt am Main, FRG, on behalf of the USAE Waterways Experiment Station, CE, Vicksburg, Miss. (WES), under a contract from the U.S. Army European Research Office, London. Administrative support for conducting this study was given by the German Federal Ministry of Defense (MOD), Rü III 5. The study is aimed at providing environmental data support (land-use, crop/vegetation types and heights, meteorological data) to the WES Mine/Countermining Research Program.

Personnel participating in the ground truth sampling included P. Jessl and W. Köppel, Vehicle Technology Department (BIEV). Photo interpretation and terrain map preparation were the responsibilities of P. Jessl and U. Liebe. The report was written by P. Jessl and W. Köppel; W. Köppel was the principal investigator.

ABSTRACT

Federal Republic of Germany.

This report describes the procedure of mapping crop/vegetation data for two selected flight line areas (Darmstadt, Fulda) in the ~~FRG~~. Mapping was based on the analysis of aerial photographs taken from 300' and 600' flight heights and on ground truth data sampling. In addition, interviews were conducted both with farmers in the areas of interest and with agricultural researchers. Meteorological data were collected on a statistical basis to evaluate the land-use and surface conditions existing during the September 1982 terrain data sampling by ~~WES~~.

Ft.

*the U.S. Army Engineer Waterways
Experiment Station.*

Keywords:

Terrain data

Crop type

Land use

Mine/countermine program

See p-17

INTRODUCTION

Background

An extensive data acquisition effort was completed by the U.S. Army Engineer Waterways Experiment Station (WES) in September 1982 in two areas of Germany as part of the WES Mine/Countermine Research Program. This effort included multispectral imagery, aerial photography, temperature measurements and a limited amount of site characterization. BIEV was asked to classify the terrain by mapping the crop types, vegetation heights, crop conditions, etc., during the field data acquisition. Thus, site characterization by means of ground truth and aerial photographs will permit further analysis of mine detection concepts using multispectral imagery.

Purpose and Scope

The purpose of the study is to provide terrain data (land-use, crop types, crop heights, vegetation heights, meteorological data) within two specified flight line areas (Darmstadt, Fulda) based on a two-phase program. The second phase is intended to cover a generalization of Central European land-use characteristics in relation to the two above flight line areas.

Analysis of terrain data in Phase 1 finally yields terrain factor maps prepared on the basis of the interpretation of WES photographs, site visits, interviews with farmers and a survey of prevailing agricultural practices in Germany (see /1/).

MAPPING PROCEDURE

Surface and Vegetation Data

In order to generate terrain factor maps on crop/vegetation types, crop/vegetation heights and crop/vegetation conditions, some basic assumptions on the classification of terrain factors were made. Details of these assumptions will be given below. In a first step, a very detailed land-use classification was made in order to distinguish between all apparently different patches of the flight line areas. Later on, the land-use was divided into 24 classes (crop type A) in a second step, and into 11 classes (crop type B) in a third step. Heights and conditions were classed into seven and four categories, respectively. Both heights and conditions were classified according to the prevailing meteorological conditions, the local land-use practices as well as the actual information from aerial photography.

Crop and Surface Conditions

The various conditions of crop/vegetation were classified for the study on the basis of (a) the weather conditions within the flight line areas during the field activities and especially prior to them, (b) the agricultural site conditions (soil type, drainage condition, local land-use practices, etc.), (c) general growth practices, and of course (d) the actual aerial photographs. Details on the various classes chosen are given later.

The weather conditions prior to the WES field tests can be characterized as follows:

The 1982 summer season was characterized by higher-than-average temperatures and lower-than-average precipitation for most of the country including the two test site areas (Table 1). During August and September precipitation in the Fulda area was just

20 % of the long-term average values, while Darmstadt had about 65 %. The temperatures in Fulda were 1.8 to 2.9°C higher than usual, while Darmstadt figured a 0.2 to 2.2°C temperature increase.

Generally, the September conditions were too hot, too dry and accompanied by an extremely long total sunshine period (122 % of the 10-year average for the Darmstadt area and 138 % for the Fulda area). Table 1 shows the comprehensive climatic data recorded by the Darmstadt and Bad Hersfeld weather stations from April to September 1982.

The dry 1982 summer season badly influenced the yield of all truck crops. Turnips, sugar beets and potatoes showed poor results while cereals had extremely good conditions; corn in the Darmstadt area yielded poor results because of infestation with lice. The beef-raising crops' condition suffered considerably, with generally reduced growth heights especially at the second cut in September.

Fig. 1 shows a precipitation map of Germany depicting long-range average values.

Interpretation of Photographs

Mapping of crop types, crop heights and conditions was based on aerial photographs taken at 300' and 600' flight heights by a WES contractor. The flight line areas at Darmstadt and Fulda had a length of approximately 3.0 and 3.5 km, respectively, and a width of 150 m. 39 photographs taken at 600' flight height from the Darmstadt flight line and 63 photographs from Fulda were available, while 75 and 82 photographs, respectively, were evaluated which had been taken at 300' flight height.

It was agreed to map two flight line overlays on the scale of approximately 1:2,500 from the 600' imagery, while providing continuous overlays for the 300' imagery (scale $\approx$ 1:500) as a data base for more detailed information.

In a first step, the photographs were trimmed in such a way that they could be arranged next to each other, making up a continuous flight line.

After that, photograph number/contour maps were prepared in order to allow quick comparison between position and number of a specific photograph in the flight line.

This arrangement of the imagery facilitated a comprehensive understanding of the land-use characteristics in the two areas.

Then, the actual factor maps were established sequentially in the following order:

- a) Land-use basic information
- b) Crop type A
- c) Crop type B
- d) Crop/vegetation height
- e) Crop/vegetation condition

Land-use Basic Information Map

This map indicates all patches which are apparently different in land use, colour, texture, etc., irrespective of the origin of these differences. The patches were consecutively numbered in south-north direction. Patches with identical land-use characteristics but not neighbouring each other were given different patch numbers. A total of 140 patches were identified in each of the two flight line areas of Darmstadt and Fulda (see Tables 2a and 2b). Mapping was effected first on the 1:500

scale overlays⁺), being transferred into the 1:2,500 scale flight line map later.

Crop_Type_A_Maps

In a second step, a crop type A map was generated featuring various cultivating differences and cutting stages in a very detailed order. This was done for establishing a specific crop type data base and yielded about 24 classes of crop types (see Table 3). It is understood as a working map only, whereas the following crop type B maps are to be used as basic descriptors of the terrain factor "crop type".

Crop_Type_B_Maps

In these maps, the 24 above classes have been lumped down to 11 classes (see Table 4), taking into account various similarities of cultivated areas and greenland. For example, plowing, harrowing and surface chopping of soils has been summarized as "cultivated", e.g. map code 001. Because of their different characteristics in growth and appearance, truck crops such as turnips, potatoes and sugar beets on the other hand, are separately mapped.

Crop/Vegetation_Height_Maps

These maps were established basically by referring to the seasonal growth height development of German plants (see Table 7) and to height characteristics of German tree species (see

⁺) These overlays were submitted to WES on 24th August 1983

/2/). This classification considers local changes in crop conditions if these have a major effect on height growth (see Tables 5 and 6).

Crop/Vegetation Condition Maps

The condition maps reflect three site conditions (Table 6) for vegetation and crops which are due to site factors such as drainage, soil quality, climate etc. It was felt that a classification according to poor, normal and good condition satisfactorily characterizes the main crop properties.

Generally, the photo-interpretation process involved both qualitative and quantitative understanding of

- German crop types, plants, tree species and
- prevailing land-use practices

in connection with the meteorological conditions.

Identification of crop types was quite unambiguous, with a few exceptions: because of the extremely hot and dry summer conditions of 1982, the growth of meadows, pastures and green fodder was adversely affected, and most of the patches were heavily withered up. These patches thus took on a brown-yellowish colour similar to that of dry cultivated (harrowed, chopped) soils and stubble fields. Under normal conditions, a dark-green appearance of the green fodder patches would have been expected during that season. Another aerial photograph identification problem arose from the similarity between turnips and sugar beets. As their height growth does not exhibit major differences and their leaves are very similar, too, there are hardly any reliable means of distinguishing these truck crops by aerial photograph data only. Thus, the differences in their shape and projection above ground level have to be identified in order to characterize the different crops. Turnips are in

general barrel-shaped and grow approximately 90 % above ground level, while sugar beets are wedge-shaped and grow just 10 % above ground level (see Figs. 2 and 3). An aid in the interpretation of aerial photographs was the agricultural practice of planting small turnip strips along the edges of sugar-beet fields in order to facilitate harvesting: if these turnip patches are harvested earlier manually, farm equipment can be moved without damaging neighbouring crops.

In general, the height identification of crops and trees did not cause severe problems. Classification of heights was performed on the basis of the agricultural growth height development (Table 7) and of the prevailing seasonal/meteorological characteristics and the height development of German tree species /2/.

Both crop types and heights were reclassified whenever ground truth acquisition and interviews with farmers yielded results contradictory to the maps.

Ground Truth Data

From May 3 to 5, 1983 ground truth data were collected and interviews with farmers held within both flight line areas Darmstadt and Fulda. In addition, agricultural researchers were questioned about the land-use mapping achieved from the imagery; possible sources of problems were identified (turnips/sugar beets, meadows/cultivated fields) and mapping was finally established.

A total of six farmers were interviewed in the two areas (three in each area); on the basis of these interviews, the following basic statements can be made:

- All beef-raising crops (pastures, meadows, rape, etc.) had poor results due to the hot and dry summer season.
- Truck crops (turnips, sugar beets) had poor conditions.
- Cereals found extremely good conditions in both areas.
- The predominant crop types for the flight line and neighbouring areas were estimated as follows:

-- Darmstadt

Cereals (barley 80 %, wheat 20 %); truck crops (sugar beets dominating over turnips); corn.
Green fodder.

-- Fulda

Mixed cereals prevailing (oat, barley, rye); truck crops (turnips, potatoes).
Meadows/pastures.

- Beef-raising crops were roughly classified as yielding only 50 % compared to normal conditions.
- The yield of corn crops in the Fulda area depends critically on the local drainage conditions; thus, the heights may vary between 150 cm and 210 cm.

CROP TYPES AND CLASSIFICATION

Structure of German Crop Types

Agricultural areas in Germany are classified statistically down to the district level every two years according to the percentage values of land use. This analysis for the two districts of interest - Burghaun and Geinsheim - which are included in the flight line areas, is shown in Table 8. Regarding the districts of Groß-Gerau and Fulda as a data base, cereals are predominating within the Darmstadt area while green fodder and meadows/pastures prevail in the Fulda area.

Growth, Planting and Harvesting Practices

On the basis of the general structure of the German agricultural areas (Table 9), growth heights and planting periods can be identified as given in Tables 7 and 10.

Cereals, corn and rape usually reach average heights of 20 to 120 cm from May to August. Corn, however, may grow up to 200 cm from August to October if it is kept as a grain crop for beef-raising purposes. Sugar beets, potatoes and other green fodder types grow about 10 to 30 cm high during the May to October/November period. Meadows and pastures usually reach heights of 10 cm from September to May, while heights of 40 to 50 cm are occasionally reached between May and August.

Soils are normally plowed immediately after harvesting. Here, we have to distinguish between plowing, milling and chopping of the soil. Plowing turns the soil up to a depth of 35 cm. By milling or chopping, the stubbles of cereals are generally mixed with the soil down to a depth of 10 cm. Later on, plowing is performed again after approximately four weeks.

Farmers are anxious to ensure that the plowed soils are loosened by frost. Only after very wet fall periods - when plowing is not possible - plowing is done in March/April.

The exact plowing date is determined according to the crops to be planted. In the case of truck crops, plowing is generally done in fall (November). Green fodder is predominantly farmed directly after cropping winter barley or early potatoes. Thus, plowing is done three weeks before planting (i.e. early July) (see Table 10).

Immediately before planting, the plowed soil is broken down and reworked to a depth of 5 cm.

Cereals generally grow on all types of soil; wheat and barley are more fastidious than rye and oat. Thus, rye and oat are predominating on sandy (i.e. poor) soils and in more elevated locations (above 500 m altitude, i.e. in the Fulda area). Sugar beets and rape are mainly cultivated on silty and clayey soils, while potatoes prefer sandy soils; corn has no preference at all.

Description of Common Crop Types

The crop types met most frequently in agricultural areas are briefly described in the following summary, which is backed up by various agricultural drawings (Figs. 4 to 12 and Photographs 1 to 20).

Corn

Corn, which reaches growth heights of up to 200 cm (see Table 7 and Photograph 1), is exclusively used for beef-raising purposes.

Turnips

Turnips, which are barrel-shaped and normally grow up to 90 % above ground level (see Fig. 3 and Photograph 2), are used as beef-raising food.

Sugar beets

Sugar beets have a leave shape similar to that of turnips and can only be distinguished from those by their wedge shape and their 10 % growth above ground level (see Fig. 2 and Photograph 3).

Wheat

Wheat is the most important cereal in Germany; it demands good site conditions, avoiding extreme climatic areas. The fruit shape is shown in Fig. 4.

Rye

Rye constitutes a very resistant cereal which accepts also rather unfavourable climatic conditions. It is usually met in the northern areas of Germany (see. Fig. 5).

Barley

Barley is frequently found in river depressions such as the Rhine valley (Darmstadt flight line area), i.e. low-precipitation areas with base-rich soils (Fig. 6).

Oat

Oat is the least important German cereal; it is met predominantly in the Central Highlands and in the north-east. Oat does not need favourable climatic and soil conditions (Fig. 7).

Green fodder

This term normally summarizes all kinds of beef-raising fodder such as rape, lucerne, clover, grasses, lupine, etc., which

are discussed below. Secondly, green fodder is used for the so-called "green dung" procedure (enrichment of the soil with organics after plowing the green fodder into the soil mass).

- Rape

Rape is used for both beef raising and vegetable-oil production. Rape has recently regained some importance as green fodder plant (Fig. 8 and Photograph 4).

- Lucerne

Lucerne constitutes the most important green fodder in the central and southern dry areas of the country (Fig. 9).

- Clover

These fulfil a major roll together with grasses, guaranteeing a balanced organic soil household (Fig. 10). They contribute essentially to the green dung procedure.

- Lupine

Lupine is predominantly met on the sandy soils in the north. This beef-raising crop also contributes remarkably to the green dung procedure (Fig. 11).

- Grasses

One of the most important beef-raising crops are pure and mixed grass crops (e.g. grass-clover mix). Usually, fine-grained soils provide favourable growth conditions (Fig. 12).

Soil Cultivation

"Soil cultivation" can be broken down into the following basic procedures:

- plowing (depth approx. 35 cm) (see Photograph 5, left-hand portion)

- harrowing (see Photograph 5, center)
- chopping/milling

The soil cultivation procedure for stubble fields (harvested grain crops), however, has to be regarded separately. Farmers make use of the natural manure effects of the stubbles as outlined below.

As to the crop type classification of agricultural areas, "soil cultivation" needs some care to be defined for stubble fields in terms of cultivation depth and related farm implements. Cultivated stubble fields which are defined as class 20 in the crop type A class system (or as class 001 in the crop type B class system) can be generated in basically three ways, the general procedure of cultivation being defined as "chopping/milling". The three procedures are:

(1) "Plow harrowing":

Hook-shaped fixed lances penetrate into the stubble field soil to a depth of approximately 4 to 6" (Photographs 7, 8, 9, 10, 11, 12, 13, 14, 15). This is the most commonly applied stubble field cultivation procedure.

(2) "Chopping" by means of a rotary plow:

Rotating knives penetrate into the stubble field soil down to approximately 3 to 5" depth (Photographs 6⁺ and 16).

(3) "Shallow plowing":

Cutting of the stubble field soil in terms of shallow plowing down to approximately 5" depth (Photograph 17).

+) This photograph shows the result of chopping of a stubble field. The chopping procedure applied to other fields is identical.

In some cases, farmers are burning down the stubbles before cultivating the soil (Photograph 7; next to the orchard, stubbles were not burnt). Photographs 4 and 18 show rape growing on the stubble field being used to build up the "green dung" procedure; here, the soil will be enriched with organics later when the green fodder is plowed into the soil mass.

Photographs 13 and 19 show turnips and sugar beets; turnips, approximately 90 % of whose length is above ground level (see Photograph 2) are not arranged in rows.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

On the basis of the proposed classifications and mapping of land-use characteristics in two flight line areas, it is concluded that the crop conditions were different for cereals and truck crops due to the prevailing climatic conditions prior to the establishment of the imagery. The growth history of various agricultural crops and their dependence on meteorological conditions can be sufficiently predicted for environmental support purposes. Thus, a generalization of land-use practices for large-scale European land-use conditions can be derived from existing results of the two test areas. As the thematic maps and extensive statistics required for such a task are available, all necessary data conditions are met.

Recommendations

→ The results of this study should be used as an input for generalization of crop types and conditions for Central European land-use characteristics. Large-scale imagery (e.g. satellite photographs), various thematic maps and well-defined regionalization of Germany/Central Europe will generate the desired results for a limited number of defined land-use terrain factors. A supplementary classification of major geographic regions in Germany, even down to the district level, can be made on the basis of agricultural crop distribution and land use, which are taken from thematic maps and statistical sources. Thus, it will be possible to identify the likely distribution of land-use and the extent of continuous crop coverage for high cross-country mobility areas within specific regions. To quantify similarity between the two sets of data, the land-use characteristics of the two flight line areas have to be compared with the prevailing German land-use conditions.

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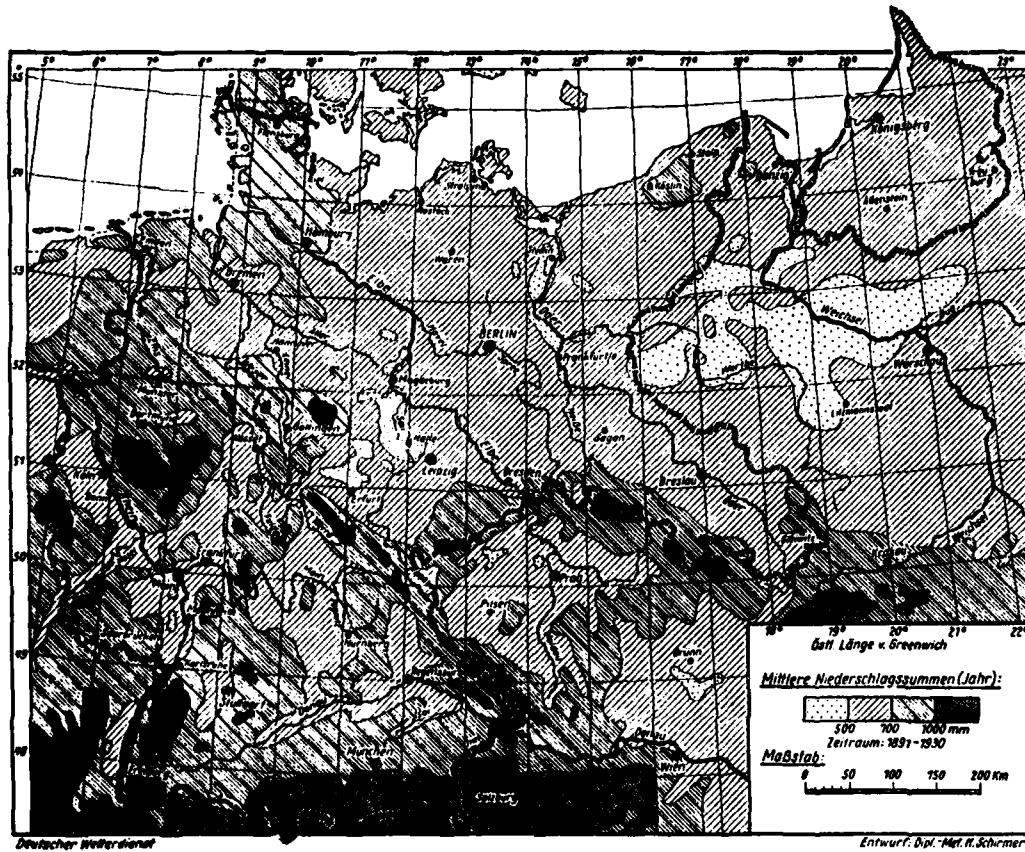


Fig. 1: Precipitation Map of Germany (Average Annual Rainfall 1891-1930 in mm)



Fig. 2: Sugar Beet (wedge-shaped)

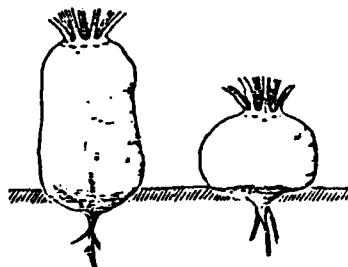


Fig. 3: Turnip (barrel-shaped)

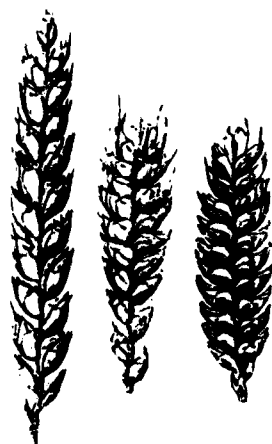


Fig. 4: Wheat

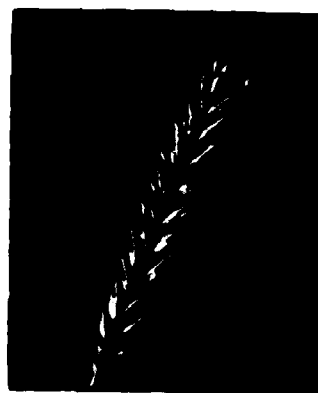


Fig. 5: Rye

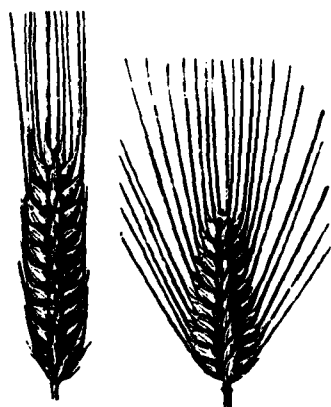


Fig. 6: Barley

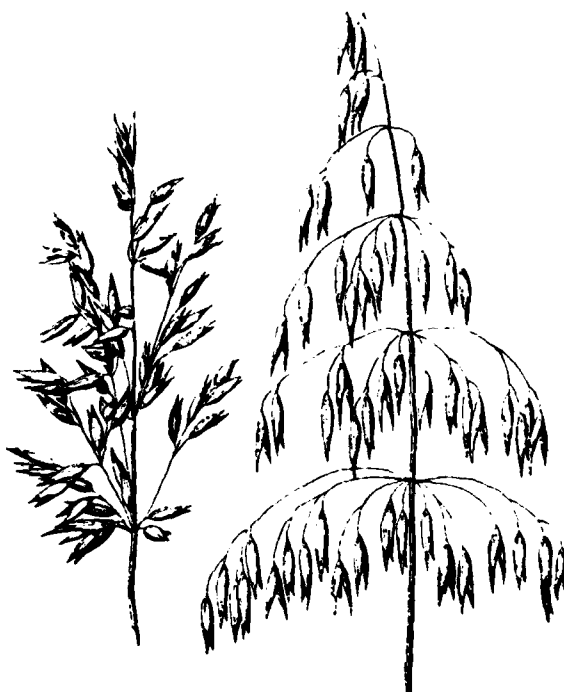


Fig. 7: Oat



Fig. 8: Rape



Fig. 9: Lucerne



Fig. 10: Clover (Red Clover, Swedish Clover)



Fig. 11: Lupine



Fig. 12: German Grasses

[illegible]

♦♦) nearest weather station of the Darmstadt flight line

Klimatologische Werte für Mai 1982

Station	Höhe m	Koordinaten	Lufttemperatur										Niederschlag										Sonnenstunden		Bewölkung		Wind	
			Mittel		Abweichung		Maximaler Wert		Tiefster Wert		Summe		Maximaler Wert		Tagesniederschlag		Tagesniederschlag		Tagesniederschlag		Tagesniederschlag		Tagesniederschlag		Tagesniederschlag			
			°C	°C	°C	°C	°C	°C	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
Mecklenburg	4	013	10.1	10.0	-0.1	10.0	27.0	2.0	2.0	2.0	93	31	73	10.21	14	9	1	230	94	3	7	2	5	1				
Liet auf Sylt	26	020	17.1	10.6	-0.2	21.9	27.0	2.1	2.0	2.0	41	26	10	7.0	10	7	1	239	95	3	12	1	9	1				
Schwesing	28	026	10.1	10.6	-0.4	20.0	27.0	0.0	0.0	2.0	70	50	104	19.22	14	9	1	225		4	8	2	2					
Schleswig	43	035	10.0	11.1	0.1	20.5	27.0	0.0	2.0	1.0	70	70	130	10.10	14	12	1	226	91	2	12	3						
Kiel-Kronshagen	17	048	10.0	11.5	0.1	27.7	27.0	-0.3	0.0	2.0	74	70	105	20.10	14	14	1	220	98	4	14	1						
Hordorney	11	113	10.1	11.1	0.1	20.0	27.0	2.1	0.0	2.0	40	30	80	12.21	15	7	1	250	107	2	6	2	3					
Bromerhaven	7	129	10.0	12.2	0.2	27.0	27.0	1.7	10.0	3.0	70	40	90	11.27	17	10	1	225	98	3	8	3	6					
Cuxhaven	5	131	10.0	11.4	-0.5	27.0	27.0	2.7	2.0	2.0	70	60	127	16.22	14	12	1	232	97	3	8	2	4					
Hamburg (Flugh.)	13	147	10.0	12.2	0.2	27.7	27.0	-0.4	0.0	2.0	70	60	119	19.10	15	10	1	222	96	5	9	3	3					
Lübeck	8	156	10.0	12.0	0.2	20.0	27.0	1.4	2.0	4.0	70	57	101	8.22	16	12	1	225	90	6	9	2						
Enden-Neesele	6	203	17.0	17.3	0.5	27.2	10.0	0.5	0.0	4.0	70	40	70	7.10	16	12	1	240	106	2	6	5	3					
Bremen (Flugh.)	4	224	10.0	12.1	-0.7	27.3	10.0	-2.0	0.0	2.0	70	71	127	23.10	16	12	1	233	101	3	9	7	2					
Sothau	77	238	10.0	12.2	-0.2	20.3	27.0	-1.1	10.0	4.0	70	60	114	12.10	15	12	1	220	97	4	12	5						
Lüchow	17	253	10.0	12.7	-0.2	27.5	27.0	-0.4	0.0	4.0	70	60	99	9.22	14	10	1	240	100	5	11	5	1					
Lingen	21	305	10.0	13.2	0.2	20.0	10.0	0.7	0.0	4.0	60	51	94	9.27	17	11	1	230	117	7	8	2						
Münster	60	313	10.0	13.5	0.7	20.7	10.0	1.0	0.0	5.0	60	60	130	16.10	16	12	1	242	107	9	7	4	2					
Osnabrück	95	317	10.0	12.0	0.1	20.1	27.0	1.1	0.0	3.0	60	60	131	13.10	17	13	2	240	100	9	8	3						
Bad Salzuflen	90	325	10.0	13.2	0.3	20.2	27.0	0.0	0.0	3.0	70	73	120	14.22	16	9	1	229	103	7	9	6						
Hannover (Flugh.)	53	330	10.0	12.9	0.3	20.0	27.0	0.2	0.0	4.0	70	61	90	9.22	16	14	1	230	105	5	9	3	1					
Braunschweig-V.	81	340	10.0	13.2	0.1	27.0	27.0	1.5	2.0	3.0	60	50	93	8.20	18	13	1	223	100	6	9	6	3					
Berlin-Dahlem	51	381	10.0	13.7	-0.1	20.0	17.0	1.3	3.0	4.0	60	63	130	16.22	13	11	1	250	105	6	7	6						
Berlin-Temp. (Flugh.)	48	384																										
Bocholt-Liedern	21	400	10.0	13.1	0.3	27.7	27.0	1.4	2.0	5.0	70	60	100	8.00	15	14	1	240	110	7	8	2						
Essen-Gröden	154	410	10.0	13.5	0.4	27.0	10.0	1.4	2.0	5.0	60	100	150	20.22	16	12	1	221	104	8	9	6						
Düsseldorf (Flugh.)	37	400	10.0	14.1	0.0	20.4	10.0	1.1	2.0	5.0	60	77	150	15.22	16	12	1	217		8	9	5	3					
Köln-Porz	839	427	10.0	10.0	0.2	27.7	27.0	-2.0	0.0	5.0	70	60	100	10.10	20	13	3	196	95	6	10	6	2					
Bad Lipprings	157	430	10.0	12.0	0.2	20.1	27.0	1.2	0.0	3.0	70	70	112	12.00	17	14	1	222		7	10	5						
Kassel	231	430	10.0	13.0	0.0	27.0	27.0	-0.2	2.0	4.0	60	60	100	23.20	16	9	2	221		6	9	5	1					
Göttingen	175	444	10.0	12.9	0.0	20.0	27.0	0.4	0.0	4.0	60	60	101	19.20	14	12	2	216	101	5	11	4						
Braunlage	607	452	10.0	10.1	0.2	27.7	27.0	-1.3	0.0	3.0	70	60	82	22.20	17	12	4	200	95	4	14	3						
Aachen	202	501	10.0	13.4	0.5	20.4	20.0	2.5	2.0	5.0	60	120	100	43.10	18	13	1	214	104	9	10	5						
Münster	627	510	10.0	10.0	0.3	20.0	10.0	-1.5	2.0	5.0	70	62	87	11.10	16	10	4	217		6	13	4	1					
Helm-Mann (Flugh.)	75	513	10.0	13.0	0.4	20.5	27.0	-0.7	2.0	4.0	60	70	140	23.10	16	13	1	213		8	12	4	2					
Bad Marienberg	547	526	10.0	10.0	0.4	20.1	27.0	-1.3	2.0	5.0	70	100	147	30.10	14	12	3	200	97	7	9	5						
Gießen-Lobdigh.	186	532	10.0	13.5	0.0	27.7	27.0	0.3	2.0	3.0	60	60	100	33.10	13	11	1	231	101	6	11	3	1					
Bad Hersfeld	212	542	10.0	13.0	0.5	20.0	27.0	0.0	3.0	4.0	60	60	130	20.10	16	10	1	213	99	6	7	3						
Vesserkuppe	921	544	10.0	0.0	0.3	27.7	27.0	-3.4	2.0	5.0	70	60	70	21.10	17	10	5	227	104	7	9	4	10	1				
Trier-Petrisberg	265	609	10.0	13.2	0.1	20.0	20.0	1.0	2.0	5.0	60	32	54	7.10	13	8	1	240	110	8	8	5	1					
Deuselbach	480	615	10.0	11.0	0.3	20.0	31.0	0.2	2.0	5.0	70	35	52	9.20	13	9	1	237	101	6	8	2	4					
Geisenheim	109	620	10.0	13.0	-0.4	27.7	27.0	0.7	0.0	5.0	60	61	117	22.10	13	8	1	241	103	8	7	4	1					
Kl. Feldberg/Te.	805	635	10.0	9.5	0.1	27.1	27.0	-2.5	2.0	5.0	70	110	171	37.10	15	12	3	210	100	6	6	4						
Frankfurt (Flugh.)	111	637	10.0	13.0	0.0	20.2	27.0	-1.2	3.0	5.0	70	70	120	33.10	15	8	1	247	100	7	10	1	1					
Darmstadt	108	639	10.0	14.3	-0.1	20.2	27.0	-0.2	0.0	4.0	60	63	123	14.10	13	10	1	251	103	6	9	3	1					
Würzburg	260	655	10.0	13.5	0.0	27.0	27.0	0.4	2.0	3.0	60	44	70	10.10	15	9	1	224	94	8	9	5	2					
Bad Kissingen	262	658	10.0	13.0	-0.1	20.1	31.0	-0.5	3.0	4.0	70	60	112	23.10	16	9	1	224	100	6	9	3						
Bamberg	239	675	10.0	13.1	-0.1	27.7	27.0	0.3	2.0	3.0	60	30	40	6.10	14	10	1	220	101	8	10	5						
Coburg	337	671	10.0	13.0	0.1	27.0	31.0	-0.5	2.0	3.0	60	60	92	17.10	14	10	1	220	90	8	10	3						
Hof-Mohrensee	567	685	10.0	11.1	0.0	20.0	31.0	-1.4	2.0	1.0	70	50	90	16.00	14	10	1	223	105	9	10	2						
Walden/Opf.	430	680	10.0	12.5	0.2	27.7	31.0	-1.0	0.0	2.0	60	32	50	7.00	11	9	1	218	96	7	8	3						
Borua	363	704	10.0	13.2	0.4	20.0	31.0	2.0	0.0	2.0	60	27	43	10.20	10	7	1	250	101	10	4	2	1					
Saarbrücken (Flh.)	323	708	10.0	13.0	0.3	20.0	31.0	1.0	3.0	3.0	60	30	41	10.20	11	8	1	240	100	6	5							
Münster/Wetz.	163	723	10.0	14.0	0.1	27.0	10.0	1.0	0.0	5.0	60	50	107	14.00	13	10	1	245	100	8	4	3						

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Station	Höhe m	Koordinaten	Lufttemperatur										Niederschlag										Sonnenschein		Bewölkung		Wind																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
			Mittel °C	Abweichung °C	Höchster Wert °C		Tiefster Wert °C		Summe mm	Tage mit Niederschlag	Tage mit Frost	Tage mit Eis	Höchst- wert mm	Höchst- wert mm		Tage mit 0,1 mm	Tage mit 1,0 mm	Tage mit 2,0 mm	Tage mit 3,0 mm	Tage mit 4,0 mm	Tage mit 5,0 mm	Tage mit 6,0 mm	Tage mit 7,0 mm	Tage mit 8,0 mm	Tage mit 9,0 mm	Tage mit 10,0 mm	Tage mit 11,0 mm	Tage mit 12,0 mm	Tage mit 13,0 mm	Tage mit 14,0 mm	Tage mit 15,0 mm	Tage mit 16,0 mm	Tage mit 17,0 mm	Tage mit 18,0 mm	Tage mit 19,0 mm	Tage mit 20,0 mm	Tage mit 21,0 mm	Tage mit 22,0 mm	Tage mit 23,0 mm	Tage mit 24,0 mm	Tage mit 25,0 mm	Tage mit 26,0 mm	Tage mit 27,0 mm	Tage mit 28,0 mm	Tage mit 29,0 mm	Tage mit 30,0 mm	Tage mit 31,0 mm	Tage mit 32,0 mm	Tage mit 33,0 mm	Tage mit 34,0 mm	Tage mit 35,0 mm	Tage mit 36,0 mm	Tage mit 37,0 mm	Tage mit 38,0 mm	Tage mit 39,0 mm	Tage mit 40,0 mm	Tage mit 41,0 mm	Tage mit 42,0 mm	Tage mit 43,0 mm	Tage mit 44,0 mm	Tage mit 45,0 mm	Tage mit 46,0 mm	Tage mit 47,0 mm	Tage mit 48,0 mm	Tage mit 49,0 mm	Tage mit 50,0 mm	Tage mit 51,0 mm	Tage mit 52,0 mm	Tage mit 53,0 mm	Tage mit 54,0 mm	Tage mit 55,0 mm	Tage mit 56,0 mm	Tage mit 57,0 mm	Tage mit 58,0 mm	Tage mit 59,0 mm	Tage mit 60,0 mm	Tage mit 61,0 mm	Tage mit 62,0 mm	Tage mit 63,0 mm	Tage mit 64,0 mm	Tage mit 65,0 mm	Tage mit 66,0 mm	Tage mit 67,0 mm	Tage mit 68,0 mm	Tage mit 69,0 mm	Tage mit 70,0 mm	Tage mit 71,0 mm	Tage mit 72,0 mm	Tage mit 73,0 mm	Tage mit 74,0 mm	Tage mit 75,0 mm	Tage mit 76,0 mm	Tage mit 77,0 mm	Tage mit 78,0 mm	Tage mit 79,0 mm	Tage mit 80,0 mm	Tage mit 81,0 mm	Tage mit 82,0 mm	Tage mit 83,0 mm	Tage mit 84,0 mm	Tage mit 85,0 mm	Tage mit 86,0 mm	Tage mit 87,0 mm	Tage mit 88,0 mm	Tage mit 89,0 mm	Tage mit 90,0 mm	Tage mit 91,0 mm	Tage mit 92,0 mm	Tage mit 93,0 mm	Tage mit 94,0 mm	Tage mit 95,0 mm	Tage mit 96,0 mm	Tage mit 97,0 mm	Tage mit 98,0 mm	Tage mit 99,0 mm	Tage mit 100,0 mm	Tage mit 101,0 mm	Tage mit 102,0 mm	Tage mit 103,0 mm	Tage mit 104,0 mm	Tage mit 105,0 mm	Tage mit 106,0 mm	Tage mit 107,0 mm	Tage mit 108,0 mm	Tage mit 109,0 mm	Tage mit 110,0 mm	Tage mit 111,0 mm	Tage mit 112,0 mm	Tage mit 113,0 mm	Tage mit 114,0 mm	Tage mit 115,0 mm	Tage mit 116,0 mm	Tage mit 117,0 mm	Tage mit 118,0 mm	Tage mit 119,0 mm	Tage mit 120,0 mm	Tage mit 121,0 mm	Tage mit 122,0 mm	Tage mit 123,0 mm	Tage mit 124,0 mm	Tage mit 125,0 mm	Tage mit 126,0 mm	Tage mit 127,0 mm	Tage mit 128,0 mm	Tage mit 129,0 mm	Tage mit 130,0 mm	Tage mit 131,0 mm	Tage mit 132,0 mm	Tage mit 133,0 mm	Tage mit 134,0 mm	Tage mit 135,0 mm	Tage mit 136,0 mm	Tage mit 137,0 mm	Tage mit 138,0 mm	Tage mit 139,0 mm	Tage mit 140,0 mm	Tage mit 141,0 mm	Tage mit 142,0 mm	Tage mit 143,0 mm	Tage mit 144,0 mm	Tage mit 145,0 mm	Tage mit 146,0 mm	Tage mit 147,0 mm	Tage mit 148,0 mm	Tage mit 149,0 mm	Tage mit 150,0 mm	Tage mit 151,0 mm	Tage mit 152,0 mm	Tage mit 153,0 mm	Tage mit 154,0 mm	Tage mit 155,0 mm	Tage mit 156,0 mm	Tage mit 157,0 mm	Tage mit 158,0 mm	Tage mit 159,0 mm	Tage mit 160,0 mm	Tage mit 161,0 mm	Tage mit 162,0 mm	Tage mit 163,0 mm	Tage mit 164,0 mm	Tage mit 165,0 mm	Tage mit 166,0 mm	Tage mit 167,0 mm	Tage mit 168,0 mm	Tage mit 169,0 mm	Tage mit 170,0 mm	Tage mit 171,0 mm	Tage mit 172,0 mm	Tage mit 173,0 mm	Tage mit 174,0 mm	Tage mit 175,0 mm	Tage mit 176,0 mm	Tage mit 177,0 mm	Tage mit 178,0 mm	Tage mit 179,0 mm	Tage mit 180,0 mm	Tage mit 181,0 mm	Tage mit 182,0 mm	Tage mit 183,0 mm	Tage mit 184,0 mm	Tage mit 185,0 mm	Tage mit 186,0 mm	Tage mit 187,0 mm	Tage mit 188,0 mm	Tage mit 189,0 mm	Tage mit 190,0 mm	Tage mit 191,0 mm	Tage mit 192,0 mm	Tage mit 193,0 mm	Tage mit 194,0 mm	Tage mit 195,0 mm	Tage mit 196,0 mm	Tage mit 197,0 mm	Tage mit 198,0 mm	Tage mit 199,0 mm	Tage mit 200,0 mm	Tage mit 201,0 mm	Tage mit 202,0 mm	Tage mit 203,0 mm	Tage mit 204,0 mm	Tage mit 205,0 mm	Tage mit 206,0 mm	Tage mit 207,0 mm	Tage mit 208,0 mm	Tage mit 209,0 mm	Tage mit 210,0 mm	Tage mit 211,0 mm	Tage mit 212,0 mm	Tage mit 213,0 mm	Tage mit 214,0 mm	Tage mit 215,0 mm	Tage mit 216,0 mm	Tage mit 217,0 mm	Tage mit 218,0 mm	Tage mit 219,0 mm	Tage mit 220,0 mm	Tage mit 221,0 mm	Tage mit 222,0 mm	Tage mit 223,0 mm	Tage mit 224,0 mm	Tage mit 225,0 mm	Tage mit 226,0 mm	Tage mit 227,0 mm	Tage mit 228,0 mm	Tage mit 229,0 mm	Tage mit 230,0 mm	Tage mit 231,0 mm	Tage mit 232,0 mm	Tage mit 233,0 mm	Tage mit 234,0 mm	Tage mit 235,0 mm	Tage mit 236,0 mm	Tage mit 237,0 mm	Tage mit 238,0 mm	Tage mit 239,0 mm	Tage mit 240,0 mm	Tage mit 241,0 mm	Tage mit 242,0 mm	Tage mit 243,0 mm	Tage mit 244,0 mm	Tage mit 245,0 mm	Tage mit 246,0 mm	Tage mit 247,0 mm	Tage mit 248,0 mm	Tage mit 249,0 mm	Tage mit 250,0 mm	Tage mit 251,0 mm	Tage mit 252,0 mm	Tage mit 253,0 mm	Tage mit 254,0 mm	Tage mit 255,0 mm	Tage mit 256,0 mm	Tage mit 257,0 mm	Tage mit 258,0 mm	Tage mit 259,0 mm	Tage mit 260,0 mm	Tage mit 261,0 mm	Tage mit 262,0 mm	Tage mit 263,0 mm	Tage mit 264,0 mm	Tage mit 265,0 mm	Tage mit 266,0 mm	Tage mit 267,0 mm	Tage mit 268,0 mm	Tage mit 269,0 mm	Tage mit 270,0 mm	Tage mit 271,0 mm	Tage mit 272,0 mm	Tage mit 273,0 mm	Tage mit 274,0 mm	Tage mit 275,0 mm	Tage mit 276,0 mm	Tage mit 277,0 mm	Tage mit 278,0 mm	Tage mit 279,0 mm	Tage mit 280,0 mm	Tage mit 281,0 mm	Tage mit 282,0 mm	Tage mit 283,0 mm	Tage mit 284,0 mm	Tage mit 285,0 mm	Tage mit 286,0 mm	Tage mit 287,0 mm	Tage mit 288,0 mm	Tage mit 289,0 mm	Tage mit 290,0 mm	Tage mit 291,0 mm	Tage mit 292,0 mm	Tage mit 293,0 mm	Tage mit 294,0 mm	Tage mit 295,0 mm	Tage mit 296,0 mm	Tage mit 297,0 mm	Tage mit 298,0 mm	Tage mit 299,0 mm	Tage mit 300,0 mm	Tage mit 301,0 mm	Tage mit 302,0 mm	Tage mit 303,0 mm	Tage mit 304,0 mm	Tage mit 305,0 mm	Tage mit 306,0 mm	Tage mit 307,0 mm	Tage mit 308,0 mm	Tage mit 309,0 mm	Tage mit 310,0 mm	Tage mit 311,0 mm	Tage mit 312,0 mm	Tage mit 313,0 mm	Tage mit 314,0 mm	Tage mit 315,0 mm	Tage mit 316,0 mm	Tage mit 317,0 mm	Tage mit 318,0 mm	Tage mit 319,0 mm	Tage mit 320,0 mm	Tage mit 321,0 mm	Tage mit 322,0 mm	Tage mit 323,0 mm	Tage mit 324,0 mm	Tage mit 325,0 mm	Tage mit 326,0 mm	Tage mit 327,0 mm	Tage mit 328,0 mm	Tage mit 329,0 mm	Tage mit 330,0 mm	Tage mit 331,0 mm	Tage mit 332,0 mm	Tage mit 333,0 mm	Tage mit 334,0 mm	Tage mit 335,0 mm	Tage mit 336,0 mm	Tage mit 337,0 mm	Tage mit 338,0 mm	Tage mit 339,0 mm	Tage mit 340,0 mm	Tage mit 341,0 mm	Tage mit 342,0 mm	Tage mit 343,0 mm	Tage mit 344,0 mm	Tage mit 345,0 mm	Tage mit 346,0 mm	Tage mit 347,0 mm	Tage mit 348,0 mm	Tage mit 349,0 mm	Tage mit 350,0 mm	Tage mit 351,0 mm	Tage mit 352,0 mm	Tage mit 353,0 mm	Tage mit 354,0 mm	Tage mit 355,0 mm	Tage mit 356,0 mm	Tage mit 357,0 mm	Tage mit 358,0 mm	Tage mit 359,0 mm	Tage mit 360,0 mm	Tage mit 361,0 mm	Tage mit 362,0 mm	Tage mit 363,0 mm	Tage mit 364,0 mm	Tage mit 365,0 mm	Tage mit 366,0 mm	Tage mit 367,0 mm	Tage mit 368,0 mm	Tage mit 369,0 mm	Tage mit 370,0 mm	Tage mit 371,0 mm	Tage mit 372,0 mm	Tage mit 373,0 mm	Tage mit 374,0 mm	Tage mit 375,0 mm	Tage mit 376,0 mm	Tage mit 377,0 mm	Tage mit 378,0 mm	Tage mit 379,0 mm	Tage mit 380,0 mm	Tage mit 381,0 mm	Tage mit 382,0 mm	Tage mit 383,0 mm	Tage mit 384,0 mm	Tage mit 385,0 mm	Tage mit 386,0 mm	Tage mit 387,0 mm	Tage mit 388,0 mm	Tage mit 389,0 mm	Tage mit 390,0 mm	Tage mit 391,0 mm	Tage mit 392,0 mm	Tage mit 393,0 mm	Tage mit 394,0 mm	Tage mit 395,0 mm	Tage mit 396,0 mm	Tage mit 397,0 mm	Tage mit 398,0 mm	Tage mit 399,0 mm	Tage mit 400,0 mm	Tage mit 401,0 mm	Tage mit 402,0 mm	Tage mit 403,0 mm	Tage mit 404,0 mm	Tage mit 405,0 mm	Tage mit 406,0 mm	Tage mit 407,0 mm	Tage mit 408,0 mm	Tage mit 409,0 mm	Tage mit 410,0 mm	Tage mit 411,0 mm	Tage mit 412,0 mm	Tage mit 413,0 mm	Tage mit 414,0 mm	Tage mit 415,0 mm	Tage mit 416,0 mm	Tage mit 417,0 mm	Tage mit 418,0 mm	Tage mit 419,0 mm	Tage mit 420,0 mm	Tage mit 421,0 mm	Tage mit 422,0 mm	Tage mit 423,0 mm	Tage mit 424,0 mm	Tage mit 425,0 mm	Tage mit 426,0 mm	Tage mit 427,0 mm	Tage mit 428,0 mm	Tage mit 429,0 mm	Tage mit 430,0 mm	Tage mit 431,0 mm	Tage mit 432,0 mm	Tage mit 433,0 mm	Tage mit 434,0 mm	Tage mit 435,0 mm	Tage mit 436,0 mm	Tage mit 437,0 mm	Tage mit 438,0 mm	Tage mit 439,0 mm	Tage mit 440,0 mm	Tage mit 441,0 mm	Tage mit 442,0 mm	Tage mit 443,0 mm	Tage mit 444,0 mm	Tage mit 445,0 mm	Tage mit 446,0 mm	Tage mit 447,0 mm	Tage mit 448,0 mm	Tage mit 449,0 mm	Tage mit 450,0 mm	Tage mit 451,0 mm	Tage mit 452,0 mm	Tage mit 453,0 mm	Tage mit 454,0 mm	Tage mit 455,0 mm	Tage mit 456,0 mm	Tage mit 457,0 mm	Tage mit 458,0 mm	Tage mit 459,0 mm	Tage mit 460,0 mm	Tage mit 461,0 mm	Tage mit 462,0 mm	Tage mit 463,0 mm	Tage mit 464,0 mm	Tage mit 465,0 mm	Tage mit 466,0 mm	Tage mit 467,0 mm	Tage mit 468,0 mm	Tage mit 469,0 mm	Tage mit 470,0 mm	Tage mit 471,0 mm	Tage mit 472,0 mm	Tage mit 473,0 mm	Tage mit 474,0 mm	Tage mit 475,0 mm	Tage mit 476,0 mm	Tage mit 477,0 mm	Tage mit 478,0 mm	Tage mit 479,0 mm	Tage mit 480,0 mm	Tage mit 481,0 mm	Tage mit 482,0 mm	Tage mit 483,0 mm	Tage mit 484,0 mm	Tage mit 485,0 mm	Tage mit 486,0 mm	Tage mit 487,0 mm	Tage mit 488,0 mm	Tage mit 489,0 mm	Tage mit 490,0 mm	Tage mit 491,0 mm	Tage mit 492,0 mm	Tage mit 493,0 mm	Tage mit 494,0 mm	Tage mit 495,0 mm	Tage mit 496,0 mm	Tage mit 497,0 mm	Tage mit 498,0 mm	Tage mit 499,0 mm	Tage mit 500,0 mm	Tage mit 501,0 mm	Tage mit 502,0 mm	Tage mit 503,0 mm	Tage mit 504,0 mm	Tage mit 505,0 mm	Tage mit 506,0 mm	Tage mit 507,0 mm	Tage mit 508,0 mm	Tage mit 509,0 mm	Tage mit 510,0 mm	Tage mit 511,0 mm	Tage mit 512,0 mm	Tage mit 513,0 mm	Tage mit 514,0 mm	Tage mit 515,0 mm	Tage mit 516,0 mm	Tage mit 517,0 mm	Tage mit 518,0 mm	Tage mit 519,0 mm	Tage mit 520,0 mm	Tage mit 521,0 mm	Tage mit 522,0 mm	Tage mit 523,0 mm	Tage mit 524,0 mm	Tage mit 525,0 mm	Tage mit 526,0 mm	Tage mit 527,0 mm	Tage mit 528,0 mm	Tage mit 529,0 mm	Tage mit 530,0 mm	Tage mit 531,0 mm	Tage mit 532,0 mm	Tage mit 533,0 mm	Tage mit 534,0 mm	Tage mit 535,0 mm	Tage mit 536,0 mm	Tage mit 537,0 mm	Tage mit 538,0 mm	Tage mit 539,0 mm	Tage mit 540,0 mm	Tage mit 541,0 mm	Tage mit 542,0 mm	Tage mit 543,0 mm	Tage mit 544,0 mm	Tage mit 545,0 mm	Tage mit 546,0 mm	Tage mit 547,0 mm	Tage mit 548,0 mm	Tage mit 549,0 mm	Tage mit 550,0 mm	Tage mit 551,0 mm	Tage mit 552,0 mm	Tage mit 553,0 mm	Tage mit 554,0 mm	Tage mit 555,0 mm	Tage mit 556,0 mm	Tage mit 557,0 mm	Tage mit 558,0 mm	Tage mit 559,0 mm	Tage mit 560,0 mm	Tage mit 561,0 mm	Tage mit 562,0 mm	Tage mit 563,0 mm	Tage mit 564,0 mm	Tage mit 565,0 mm	Tage mit 566,0 mm	Tage mit 567,0 mm	Tage mit 568,0 mm	Tage mit

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Station	Höhe m	Koordinat N	Lufttemperatur										Niederschlag										Sonnenchein		Bewölkung		Wind		Sturm h. u. o.
			Tagesmittel		Abw.- chung		Höchst. Wert		Tiefst. Wert		Summe Tage		Höchst. Wert		Tage mit Q. 1 mm		Höchst. Wert		Tage mit Q. 1 mm		Höchst. Wert		Tage mit Q. 1 mm						
			°C	°C	°C	°C	°C	°C	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm						
Helgoland	4	015	19.2	17.2	0.9	24.5	31.1	11.1	7.1	5.1	79	21	32	11	2.1	5	5	5	5	5	5	299	130	5	3	1	5		
Liet auf Sylt	26	020	19.7	17.3	0.9	28.1	31.1	11.1	5.1	5.1	78	31	47	10	2.1	6	5	5	5	5	5	302	125	5	5	4	9		
Schwesing	20	026	19.2	17.1	0.8	28.0	30.1	11.1	19.1	6.1	74	28	32	16	4.1	6	6	6	6	6	6	294	131	6	4	4	1		
Schleswig	43	035	19.9	17.8	1.3	28.1	31.1	10.0	19.1	6.1	72	42	25	17	4.1	5	5	5	5	5	5	311	131	3	4	3	1		
Kiel-Kronshagen	17	045	19.8	18.1	1.2	30.4	31.1	9.6	14.1	9.1	71	51	41	23	4.1	5	4	4	4	4	4	325	136	11	4	2	1		
Norderney	11	113	19.2	17.8	1.0	29.0	31.1	12.7	7.1	5.1	79	18	23	5	6.1	7	5	5	5	5	5	244	115	9	3	3	3		
Bremerhaven	7	129	19.1	18.9	1.8	30.2	31.1	10.7	6.1	4.1	75	30	32	22	27.1	8	4	4	4	4	4	244	139	7	3	3	2		
Cuxhaven	5	131	19.1	18.3	1.1	27.6	31.1	12.4	8.1	4.1	75	35	37	9	6.1	8	6	6	6	6	6	103	137	6	4	4	2		
Hamburg (Flugh.)	13	147	19.1	18.8	1.8	30.5	31.1	10.7	6.1	11.1	71	31	38	9	6.1	9	9	9	9	9	9	104	139	6	2	2	1		
Lübeck	8	156	19.8	18.9	1.2	33.0	31.1	10.2	6.1	14.1	68	43	51	16	15.1	8	7	7	7	7	7	113	127	6	3	2	1		
Eden-Hesserland	6	203	19.7	18.5	1.6	29.1	31.1	10.9	10.1	11.1	73	21	23	12	6.1	8	6	6	6	6	6	271	135	7	5	2	1		
Bremen (Flugh.)	4	224	19.6	18.8	1.4	30.2	31.1	7.1	6.1	11.1	73	24	28	8	2.1	7	6	6	6	6	6	244	128	3	4	3	1		
Sollau	77	235	19.7	18.9	1.8	31.4	31.1	7.5	6.1	14.1	68	14	16	3	16.1	7	5	5	5	5	5	276	134	6	5	4	1		
Lüchow	17	235	19.4	19.4	1.5	32.5	31.1	7.3	27.1	19.1	68	33	50	12	16.1	8	6	6	6	6	6	314	140	5	5	4	1		
Lingen	21	305	18.6	19.4	2.2	30.8	31.1	9.4	1.1	13.1	63	13	14	3	27.1	10	4	4	4	4	4	265	142	7	5	1	1		
Münster	60	313	17.2	19.8	2.4	30.2	31.1	9.4	1.1	13.1	65	13	15	4	2.1	5	3	3	3	3	3	241	134	8	4	2	1		
Donaueschingen	95	317	19.9	19.3	2.0	29.8	31.1	9.8	6.1	12.1	66	16	17	4	2.1	4	4	4	4	4	4	268	117	8	5	2	1		
Bad Salzungen	98	325	19.0	19.4	1.9	30.0	31.1	9.7	1.1	14.1	68	17	19	13	3.1	4	1	1	1	1	1	248	145	6	4	2	1		
Hannover (Flugh.)	53	338	19.7	19.3	1.9	30.2	31.1	9.0	4.1	14.1	71	27	32	15	3.1	7	5	5	5	5	5	272	132	7	7	5	1		
Braunschweig-V.	81	348	19.3	19.2	1.6	29.6	31.1	9.6	6.1	15.1	65	24	35	13	14.1	6	4	4	4	4	4	274	132	6	4	5	1		
Berlin-Dahlem	51	381	19.2	20.4	1.9	31.8	31.1	9.5	6.1	19.1	61	32	46	22	3.1	6	6	6	6	6	6	312	129	9	3	3	1		
Berlin-Temp. (Flugh.)	48	384	19.9	21.0	1.7	32.5	31.1	11.5	1.1	10.1	67	34	50	24	3.1	6	3	3	3	3	3	327	130	9	4	3	1		
Bocholt-Liedern	21	406	19.3	19.4	1.9	31.8	31.1	9.1	18.1	15.1	69	14	16	7	3.1	5	4	4	4	4	4	259	133	5	4	2	1		
Essen-Bradney	154	410	19.2	19.5	2.0	30.5	31.1	10.8	1.1	13.1	66	23	23	12	3.1	10	4	4	4	4	4	241	135	7	7	2	1		
Düsseldorf (Flugh.)	37	400	19.5	20.2	2.0	31.8	31.1	9.4	1.1	14.1	66	20	20	9	3.1	10	3	3	3	3	3	229	137	6	6	3	1		
Kahler Asten	839	427	19.9	1.7	24.8	31.1	6.4	5.1	1.1	1.1	75	27	21	20	3.1	9	3	3	3	3	3	234	129	4	7	3	1		
Bad Lippspringe	157	430	19.0	19.7	1.6	30.4	31.1	9.9	1.1	13.1	71	41	51	22	15.1	8	5	5	5	5	5	218	130	9	7	3	1		
Kassel	231	438	17.7	19.9	2.5	31.1	31.1	9.3	1.1	14.1	63	15	21	12	3.1	6	2	2	2	2	2	229	130	3	4	2	1		
Göttingen	175	444	18.1	19.6	2.1	31.7	31.1	9.2	1.1	14.1	66	32	43	20	15.1	5	3	3	3	3	3	249	129	5	4	2	1		
Braunlage	607	452	17.9	18.9	2.3	27.7	31.1	7.3	5.1	4.1	67	33	24	17	3.1	5	5	5	5	5	5	263	136	7	7	2	1		
Aachen	202	501	18.1	19.0	1.4	32.7	31.1	9.8	27.1	12.1	70	37	49	10	14.1	10	9	9	9	9	9	210	110	8	12	4	1		
Nürnberg	627	510	17.4	18.6	1.4	28.4	31.1	9.2	5.1	1.1	74	60	130	51	21.1	13	7	7	7	7	7	221	110	5	10	6	1		
Mün-Wahn (Flugh.)	73	513	17.9	19.9	1.7	32.0	31.1	9.2	28.1	17.1	64	37	50	20	3.1	12	6	6	6	6	6	231	110	6	6	2	1		
Bad Marienberg	547	526	17.1	17.0	1.4	26.4	31.1	8.6	5.1	1.1	74	42	43	26	21.1	11	6	6	6	6	6	224	112	7	6	2	1		
Giessen-Liebigsh.	186	532	17.3	20.2	2.0	30.3	31.1	8.3	1.1	19.1	65	16	25	9	26.1	8	4	4	4	4	4	220	99	5	4	3	1		
Bad Hersfeld	212	542	17.8	20.1	2.7	32.3	31.1	7.6	1.1	14.1	63	44	46	46	21.1	9	4	4	4	4	4	227	115	6	7	4	1		
Wasserkuppe	921	544	15.4	2.1	24.0	31.1	6.4	5.1	1.1	1.1	74	41	64	32	22.1	12	8	8	8	8	8	240	121	3	9	6	6		
Trier-Petrisberg	265	609	17.4	19.7	1.9	31.4	31.1	8.4	1.1	14.1	66	32	45	10	22.1	8	4	4	4	4	4	243	117	6	4	4	1		
Osnabrück	480	615	17.0	20.9	2.1	31.4	31.1	9.3	5.1	19.1	62	51	95	30	24.1	9	5	5	5	5	5	244	111	6	6	1	1		
Geleenheim	109	628	17.0	20.9	2.1	31.4	31.1	9.3	5.1	19.1	62	51	95	30	24.1	9	5	5	5	5	5	227	106	5	4	3	1		
Kl. Feldberg/Ta.	805	635	17.7	21.0	1.8	25.7	31.1	8.8	5.1	4.1	73	44	60	14	29.1	13	6	6	6	6	6	232	106	6	4	3	1		
Frankfurt (Flugh.)	111	637	17.5	21.1	2.4	32.0	31.1	9.5	1.1	21.1	63	34	49	11	3.1	10	5	5	5	5	5	232	106	6	4	3	1		
Oerndorf	108	639	17.1	21.5	2.0	32.2	31.1	10.7	1.1	14.1	61	46	52	21	3.1	9	6	6	6	6	6	242	102	5	4	4	1		
Würzburg	268	655	17.1	20.3	1.9	30.4	31.1	10.8	5.1	19.1	66	34	50	10	3.1	8	5	5	5	5	5	224	97	4	10	6	1		
Bad Kissingen	262	658	16.9	20.1	2.2	32.4	31.1	8.5	5.1	19.1	64	47	57	13	21.1	11	7	7	7	7	7	230	105	3	9	5	1		
Bamberg	239	675	17.3	20.1	1.9	31.8	31.1	8.8	5.1	19.1	70	72	84	15	24.1	12	9	9	9	9	9	219	110	6	9	5	1		
Coburg	337	671	17.1	20.0	2.4	32.3	31.1	7.4	1.1	17.1	63	40	44	23	22.1	11	7	7	7	7	7	252	110	6	10	4	1		
Hof-Hohenstein	567	685	17.3	17.1	1.5	29.8	31.1	7.4	5.1	11.1	72	45	76	24	3.1	9	7	7	7	7	7	219	105	5	10	6	1		
Weiden/Opf.	438	688	17.0	18.8	1.7	31.2	31.1	9.0	8.1	14.1	68	42	67	19	22.1	9	8	8	8	8	8	207	93	6	10	4	1		
Beruf	363	704	17.1	19.4	2.1	30.1	31.1	9.9	28.1	12.1	70	78	104	33	3.1	8	6	6	6	6	6	252	101						

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Station	Höhe m	Koordinate	Lufttemperatur										Niederschlag										Sonnenschein		Bewölkung		Wind	
			Mittel		Abweichung		Höchster Wert		Tiefster Wert		Summe		Höchster Wert		Tage mit		Summe		Sonnenschein		Bewölkung		Wind		Wind			
			°C	°C	°C	°C	°C	°C	mm	mm	mm	mm	mm	mm	mm	mm	h	h	h	h	h	h	h	h	h	h		
Mecklenburg	4	015	12.1	17.8	0.8	26.2	4.	11.4	20.	4.	75	111	124	21	5.	19	13	258	132	5	7	6	15	2				
List auf Sylt	26	020	11.3	17.4	0.8	28.5	4.	10.0	20.	5.	77	193	220	52	15.	19	18	258	125	2	4	7	15	2				
Schwesing	28	026	12.3	16.6	0.7	30.0	5.	6.6	29.	8	1	77	164	166	39	20.	24	219		2	2	11	1					
Schleswig	43	035	12.5	16.9	0.9	30.0	7.	8.2	29.	8	1	75	129	133	25	20.	19	225	120	3	7	7	2					
Kiel-Kronshagen	17	045	12.6	16.9	0.6	30.0	5.	5.9	29.	8	1	74	73	81	14	20.	21	223	118	2	5	8						
Nordsee	11	113	12.4	17.7	0.6	28.3	4.	11.1	20.	6.		77	137	171	34	5.	16	202	107	2	5	5	10					
Bremenhaven	7	129	13.2	17.9	0.8	31.2	1.	9.2	29.	6	4	78	66	76	13	5.	18	195	107	2	7	8	9					
Cuxhaven	5	131	12.8	17.6	0.4	28.5	4.	9.7	26.	6.		76	67	75	16	20.	21	220	112	4	9	6	3					
Humburg (Flugh.)	13	147	13.4	17.5	0.9	31.5	5.	5.1	29.	7	2	76	82	98	17	14.	22	200	109	2	8	7	1					
Lübeck	8	156	13.2	17.9	0.7	31.4	4.	9.0	29.	8	3	71	68	80	11	22.	20	208	103	2	11	4						
Emden-Weserland	6	203	12.5	17.7	0.8	30.2	2.	10.5	29.	7	1	75	74	81	12	12.	20	197	108	2	5	5	7					
Bremen (Flugh.)	4	224	13.2	17.1	0.0	30.7	2.	5.1	29.	7	4	78	77	98	15	12.	19	195	107	1	8	5	4					
Sellau	77	235	13.6	17.4	0.8	30.7	1.	5.6	29.	7	4	75	76	93	17	12.	18	191	104	2	10	6						
Lüchow	17	253	13.8	17.9	0.7	30.9	5.	6.2	15.	10	4	72	54	81	16	26.	14	221	115	2	10	6						
Lingen	21	305	13.5	17.6	0.6	31.3	4.	6.8	29.	8	3	71	39	43	6	15.	19	172	106	1	7	3						
Münster	60	313	12.8	17.6	0.5	31.5	2.	7.1	29.	7	2	74	68	86	22	18.	19	175	100	2	10	2						
Donaueschingen	95	317	14.2	17.7	0.7	30.7	2.	7.2	29.	8	3	71	56	68	12	18.	21	186	109	3	8	5						
Bad Salzuflen	98	325	13.6	17.9	0.8	29.7	3.	7.6	29.	9		73	85	107	22	26.	20	188	112	2	12	5						
Mannover (Flugh.)	53	338	14.0	18.0	1.0	30.5	1.	8.1	29.	7	4	73	73	100	12	18.	19	210	112	1	8	7						
Braunschweig-V.	81	348	14.0	17.9	0.7	30.1	3.	8.7	29.	8	1	70	85	127	27	26.	15	215	119	1	11	7						
Berlin-Dahlem	51	381	14.4	18.5	0.8	31.3	5.	8.3	29.	11	2	67	46	68	32	8.	14	227	107	4	4	4						
Berlin-Temp. (Flugh.)	48	384	14.1	20.3	1.7	31.6	5.	10.4	29.	14	6	57	16	24	10	15.	7	237		5	5	5	2					
Bocholt-Liesdern	21	406	14.0	17.3	0.2	32.2	2.	6.4	29.	7	2	77	129	163	67	4.	21	185	104	2	8	4	1					
Essen-Graden	154	410	14.5	17.5	0.2	31.0	2.	9.5	29.	6	1	73	104	106	30	17.	20	185	107		11	7						
Düsseldorf (Flugh.)	37	400	14.9	18.4	0.4	32.0	2.	8.6	29.	7	3	71	85	16	18.	18	14	182			8	5						
Köln-Eifel	839	427	13.1	17.1	0.1	25.7	2.	5.7	29.	1		81	87	65	30	26.	20	165	104		14	6	2					
Köln-Eifel	157	430	14.0	17.5	0.7	31.0	2.	7.8	29.	7	2	73	133	143	36	5.	19	188		2	14	6						
Kassel	231	438	14.2	18.1	1.2	30.2	2.	8.2	29.	8	1	66	37	54	17	26.	12	210		2	8	4						
Göttingen	175	444	14.5	17.8	0.9	32.3	1.	7.6	29.	11	4	67	26	37	16	26.	13	204	118	1	10	4						
Braunlage	607	452	14.3	14.8	0.7	26.7	12.	6.3	28.	4		74	78	75	18	6.	17	213	122	1	10	6						
Aachen	202	501																										
Münster	627	510	15.2	15.0	0.0	25.4	12.	7.3	21.	1		76	114	130	63	7.	14	195			8	6						
Köln-Mehnen (Flugh.)	73	513	14.9	17.8	0.3	31.2	2.	6.2	29.	9	2	73	78	95	28	5.	15	177			10	4						
Bad Marienberg	547	526	14.4	15.1	0.3	25.9	2.	7.2	21.	2		80	86	85	15	1.	17	177	100	2	13	5						
Gießen-Liebigsh.	186	532	14.5	18.3	0.9	30.3	12.	8.4	29.	8	1	70	52	82	21	26.	11	200	100	2	9	3						
Bad Hersfeld	212	542	14.7	18.4	1.8	30.4	12.	6.9	30.	11	2	66	15	20	4	23.	13	197	116		6	2						
Wasserkuppe	921	544	13.4	0.4	24.0	12.	5.4	21.				81	29	25	9	18.	20	189	107	1	12	4	7					
Trier-Petrisberg	265	609	15.5	17.2	0.0	30.3	2.	8.0	21.	9	1	77	84	105	33	5.	15	196	107	1	10	4						
Osnabrück	480	615	15.1	15.8	-0.2	27.5	12.	6.7	21.	2		78	114	130	57	4.	18	205	96	1	13	5						
Gelsenheim	109	628	15.0	18.4	0.3	30.0	12.	8.4	21.	10	1	70	30	49	9	7.	13	199	101	1	7	4						
Kl. Feldberg/Te.	805	635	15.5	14.0	0.1	24.7	12.	5.6	21.			79	47	67	15	26.	16	178	96	3	7	3						
Frankfurt (Flugh.)	111	637	15.4	18.9	1.0	32.0	12.	8.3	23.	13	1	71	28	37	6	29.	10	197	100	3	4	5						
Osnabrück	108	639	15.3	18.8	0.2	32.0	12.	9.0	30.	10	1	71	52	71	24	18.	18	195	96	2	10	2						
Münster	268	655	15.4	18.1	0.3	29.6	12.	7.7	23.	9		71	45	66	16	8.	15	171	83	4	6	4						
Bad Kissingen	262	658	14.9	17.8	0.8	30.6	12.	7.8	23.	10	1	73	46	66	15	18.	21	176	88	3	10	3						
Bamberg	239	675	15.7	17.6	0.5	30.1	12.	6.8	30.	7	1	79	67	98	35	3.	16	188	99	3	11	2						
Coburg	337	671	15.1	18.0	1.3	30.0	12.	7.4	23.	9	1	73	35	48	7	13.	17	196	93	1	8	3						
Hof-Hohenstadt	567	685	14.9	15.8	0.9	27.2	12.	6.3	23.	6		76	110	159	34	8.	18	187	97	2	7	6						
Weiden/Opf.	438	688	15.5	16.9	0.6	29.8	12.	6.0	23.	6		75	66	99	18	3.	17	190	92	4	5	5						
Beruf	363	704	15.8	17.0	0.1	27.9	12.	7.4	21.	3		75	61	69	18	7.	16	184	81	3	6	4						
Saarbrücken (Flh.)	323	708	16.8	16.9	-0.1	27.5	12.	5.5	21.	3		76	45	54	14	7.	17	198	88	1	14	6						
Heusdorf/Westr.	163	723	15.5	18.5	0.0	30.8	12.	7.6	21.	11	1	70	46	78	10	7.	15	194	90	4	5	3						
Karlruhe	112	727	15.9	18.8	0.2	31.7	12.	8.7	21.	14	1	76	63	79	11	7.	18	202	93	3	9	6						
Mannheim	96	729	15.7	19.2	0.4	32.0	12.	8.3	21.	16	1	73	38	52	9	23.	13	188	86	1	6	5						
Stuttgart (Stadt)	286	737	16.0	18.4	0.0	30.9	12.	10.0	21.	9	1	70	138	174	45	16.	15	187	86	3	10	5						
Stuttg. (Flugh.)	373	738	16.1	17.3	-0.1	29.6	12.	6.5	21.	7		76	103	132	17	16.	16	193			4	8	5					
Öhringen	276	742	15.4	17.4	-0.1	30.1	12.	6.4	21.	8	1	78	65	80	8	13.	18	193	86	4	6	5						
Weidenburg/Bay.	422	761	15.4	17.3	0.8	30.6	12.	6.6	29.	7	1	73	107	149	57	6.												

Klimatologische Werte für September 1982

Station	Höhe m	Koordinaten	Lufttemperatur										Niederschlag										Sonnenschein		Bewölkung		Wind	
			Mittel		Abweichung		Höchst. Wert		Tiefst. Wert		Summe mm	Max. Tage	Frost- tage	Eis- tage	Max. Regen mm	Max. Schneefall mm	Höchst. Wert		Tage mit		Std.	%	Haut Tage	Tages- Tage	Gesamt Tage	Max. Wind km/h	Max. Wind km/h	
			°C	°C	°C	°C	°C	°C	mm	%							mm	mm	0, 1, 2, 3, 4, 5, 6, 7, 8, 9	mm								%
Helgoland	4	015	16.4	16.0	0.7	20.4	20.	11.6	22.	..	..	..	77	13	17	4	20.	12	3	..	153	92	2	6	2	16	1	
List auf Sylt	28	020	15.7	14.6	0.4	20.0	10.	9.5	23.	..	..	..	81	39	50	15	5.	11	7	..	143	79	1	7	2	12	1	
Schleswig	20	026	16.8	13.8	0.8	23.7	20.	5.0	12.	..	..	..	81	28	31	8	20.	11	5	..	137	7	2	5	2	2	..	
Schleswig	43	035	16.8	14.3	1.2	23.8	20.	6.0	12.	..	..	..	78	38	46	14	5.	9	5	..	147	84	3	8	3	..	..	
Kiel-Kronshagen	17	045	16.8	14.4	1.1	24.3	20.	4.4	12.	..	..	..	79	15	33	7	5.	8	6	..	155	86	6	7	2	..	..	
Norderney	11	113	16.5	15.4	0.5	23.9	19.	9.2	23.	..	..	..	80	31	39	12	20.	9	5	..	168	107	2	6	1	4	..	
Bremerhaven	7	129	17.2	15.8	1.6	24.7	20.	7.2	24.	..	..	..	81	20	29	8	20.	7	5	..	139	84	2	4	3	4	..	
Cuxhaven	5	131	16.9	15.5	1.0	24.9	20.	6.6	23.	..	..	..	78	37	44	20	20.	9	5	..	154	90	2	6	2	3	..	
Hamburg (Flugh.)	13	147	17.7	15.1	1.6	25.6	20.	4.4	12.	2	..	..	79	16	27	6	5.	7	5	..	157	92	2	7	3	1	..	
Lübeck	8	156	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Eiden-Weserland	6	203	16.3	15.7	1.5	25.5	19.	9.0	12.	3	..	..	78	18	25	5	19.	10	6	..	169	105	1	6	2	2	1	
Bräun (Flugh.)	4	224	17.1	15.2	1.2	27.3	15.	4.4	23.	4	..	..	79	15	25	5	26.	7	4	..	172	105	5	3	3	2	..	
Sollau	77	235	17.7	15.1	1.8	27.0	15.	4.4	23.	5	..	..	78	22	39	11	20.	7	4	..	184	108	4	8	3	1	..	
Lüchow	17	253	17.8	15.4	1.7	28.8	20.	4.3	29.	8	..	..	74	7	16	2	5.	5	3	..	202	111	3	7	2	..	..	
Lingen	21	305	17.0	16.4	2.3	27.5	15.	5.2	23.	5	..	..	75	16	23	5	30.	8	5	..	174	110	3	5	1	1	..	
Münster	60	313	16.2	16.5	2.3	27.9	18.	6.0	23.	7	..	..	74	19	31	6	26.	7	4	..	178	111	5	6	1	..	..	
Donaueschingen	95	317	17.7	16.7	2.8	28.3	18.	6.5	23.	6	..	..	71	23	36	9	30.	9	4	..	181	116	7	7	1	..	..	
Bad Salzungen	98	325	17.2	16.5	2.4	28.0	15.	6.8	23.	6	..	..	74	23	38	5	5.	8	8	..	178	113	3	7	2	..	..	
Hannover (Flugh.)	53	338	17.9	16.2	2.4	28.0	20.	5.3	23.	5	..	..	76	35	65	20	6.	8	5	..	185	112	6	9	2	1	..	
Braunschweig-V.	81	348	17.8	16.7	2.7	27.5	18.	6.5	23.	6	..	..	70	18	35	5	5.	9	6	..	192	114	5	5	3	..	..	
Berlin-Dahlem	51	381	18.7	16.0	2.1	27.8	20.	7.5	24.	10	..	..	72	15	33	9	6.	4	2	..	230	119	11	2	2	..	..	
Berlin-Temp (Flugh.)	48	384	18.5	17.7	2.6	28.9	20.	9.2	10.	11	..	..	63	8	18	5	5.	4	2	..	227	110	1	2	..	..	..	
Bocholt-Liedern	21	406	17.1	16.1	1.9	27.7	15.	4.1	23.	7	..	..	79	35	50	20	30.	7	5	..	174	116	3	8	1	..	..	
Essen-Gradeney	154	410	17.5	17.1	2.5	27.2	5.	8.0	23.	7	..	..	73	54	70	19	26.	12	7	..	179	119	5	7	3	..	..	
Düsseldorf (Flugh.)	37	400	17.8	17.6	2.9	29.3	5.	6.6	23.	12	..	..	71	42	57	17	30.	14	6	..	167	9	7	2	1	..	..	
Köln-Porz	839	427	17.8	17.4	2.5	29.3	17.	4.4	23.	..	..	..	80	56	52	20	20.	13	10	..	182	124	5	5	2	2	..	
Bad Lippspringe	157	430	17.4	16.6	2.5	28.3	18.	6.1	23.	7	..	..	74	22	31	6	1.	9	6	..	177	8	5	2	..	..	..	
Kassel	231	438	17.9	16.6	2.8	28.1	17.	5.2	3.	10	..	..	71	13	25	4	26.	7	5	..	206	5	4	1	1	..	..	
Göttingen	175	444	18.3	16.3	2.7	28.5	15.	6.3	23.	13	..	..	73	19	40	6	6.	9	7	..	195	126	4	5	1	..	..	
Braunlage	607	452	18.3	13.8	2.5	25.4	16.	3.0	23.	2	..	..	76	44	45	15	6.	7	7	..	188	117	4	6	2	..	..	
Aachen	202	501	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Nürnberg	627	510	18.0	15.1	2.8	25.5	17.	6.2	22.	2	..	..	74	61	103	15	5.	10	7	..	207	10	6	3	1	..	..	
Köln-Mann (Flugh.)	73	513	17.9	16.3	1.8	30.5	5.	4.4	3.	12	1	..	76	68	118	20	5.	13	10	..	185	5	5	3	..	..	..	
Bad Marienberg	547	526	17.5	14.9	2.7	25.6	17.	6.1	3.	1	..	..	78	49	61	9	18.	11	9	..	204	129	8	5	3	..	..	
Gladen-Liebigsh.	186	532	18.1	16.5	2.5	29.1	16.	4.6	3.	12	..	..	72	28	58	10	18.	8	6	..	210	136	4	3	2	..	..	
Bad Hersfeld	212	542	18.5	16.2	2.9	29.6	5.	4.6	3.	14	..	..	71	12	22	4	26.	6	4	..	204	138	4	3	2	..	..	
Wasserkuppe	921	544	..	..	..	..	..	..	..	..	..	..	75	26	27	14	21.	9	6	..	211	139	8	3	2	9	..	
Trier-Petrisberg	265	609	17.9	16.7	2.3	30.8	5.	7.4	3.	12	1	..	75	42	73	16	21.	12	6	..	201	128	8	4	3	3	..	
Deuselbach	480	615	17.7	15.7	2.3	27.0	17.	7.3	3.	7	..	..	76	34	52	12	21.	11	6	..	221	124	7	6	2	2	..	
Geisenheim	109	628	18.0	17.2	2.4	28.8	5.	8.0	3.	14	..	..	72	18	42	7	6.	8	4	..	215	132	11	3	2	..	..	
Kl. Feldberg/Is.	805	635	18.5	14.1	2.9	24.0	17.	5.9	22.	..	..	..	77	40	49	11	6.	10	6	..	203	128	10	5	1	..	..	
Frankfurt (Flugh.)	111	637	18.5	17.3	2.8	29.6	5.	5.2	3.	14	..	..	73	34	61	14	18.	8	4	..	207	128	9	3	2	..	..	
Darmstadt	108	639	18.3	17.8	2.2	30.0	5.	5.7	3.	14	1	..	71	34	60	13	6.	8	5	..	218	122	9	4	1	..	..	
Münster	288	655	18.6	16.9	2.5	30.1	5.	6.6	3.	14	1	..	72	17	32	4	22.	7	6	..	204	121	8	2	..	..	..	
Bad Kissingen	262	658	18.4	16.1	2.6	29.2	5.	5.7	23.	15	..	..	74	22	44	11	5.	7	5	..	190	120	9	1	1	..	..	
Bamberg	239	675	19.1	15.5	1.8	29.0	17.	3.5	29.	16	..	..	76	11	21	4	26.	7	3	..	209	133	5	3	1	..	..	
Coburg	337	677	18.8	16.2	2.8	29.2	17.	5.8	24.	15	..	..	75	28	51	8	30.	7	6	..	212	125	8	3	2	..	..	
Hof-Hohensasse	567	685	18.7	14.6	2.9	27.4	5.	3.4	29.	5	..	..	74	39	76	18	6.	10	5	..	226	135	7	2	..	..	..	
Weiden/Opf.	438	689	19.0	15.8	2.7	29.8	5.	2.8	24.	12	..	..	72	13	23	4	26.	7	5	..	207	121	9	3	1	..	..	
Berze	363	704	18.0	17.0	2.9	28.4	5.	8.6	27.	12	..	..	73	49	67	15	21.	11	8	..	217	120	9	2	1	2	..	
Saarbrücken (Flh.)	323	708	18.0	17.3	3.2	28.4	16.	8.0	3.																			

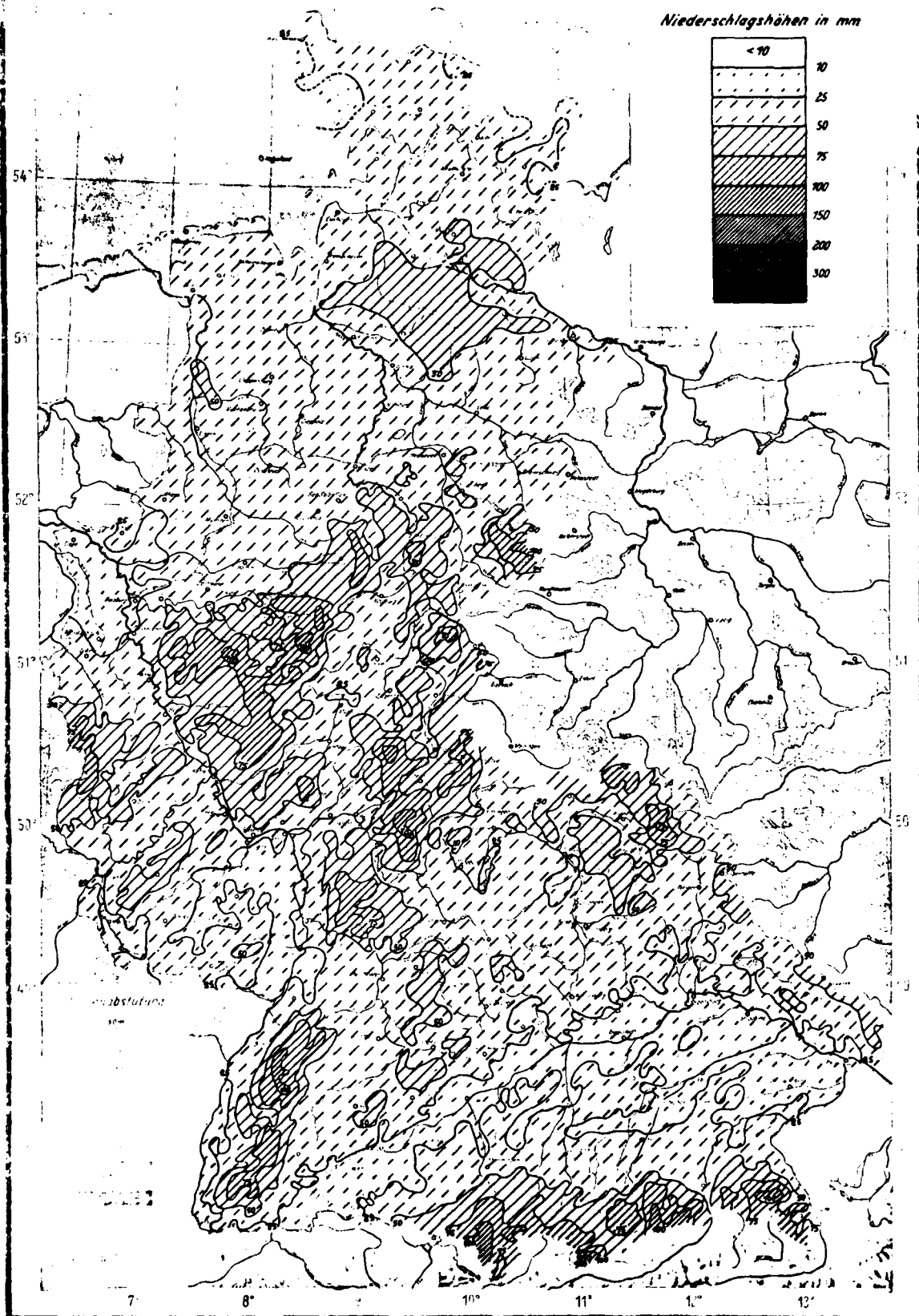
Legend of Meteorological Data for Table 1

Headings of column 1 to 29

- 1 Altitude above sea level
- 2 Code No. (internal, for weather service)
- 3 Atmospheric pressure reduced to sea level (mbar)
- 4 Mean temperature ($^{\circ}\text{C}$)
- 5 Deviation from mean value 1931-1960 ($^{\circ}\text{C}$)
- 6 Maximum temperature ($^{\circ}\text{C}$)
- 7 Maximum temperature at ... (date = day of current month)
- 8 Minimum temperature ($^{\circ}\text{C}$)
- 9 Minimum temperature at ... (date = day of current month)
- 10 Number of summerdays
- 11 Number of hot days
- 12 Number of frosty days
- 13 Number of ice days
- 14 Relative humidity, mean value (%)
- 15 Precipitation (mm)
- 16 Precipitation in % of the 1931-1960 mean value
- 17 Maximum value (mm)
- 18 Maximum value at ... (date = day of current month)
- 19 Number of days with precipitation above 0.1 mm
- 20 Number of days with precipitation above 1.0 mm
- 21 Number of days with snowfall
- 22 Number of days with snow cover
- 23 Number of hours of sunshine
- 24 Sunshine in % of the 1951-1960 mean value
- 25 Number of clear days
- 26 Number of cloudy days
- 27 Number of thunderstorm days
- 28 Number of windy days (windspeed Beaufort 6 and above)
- 29 Number of stormy days (windspeed Beaufort 8 and above)

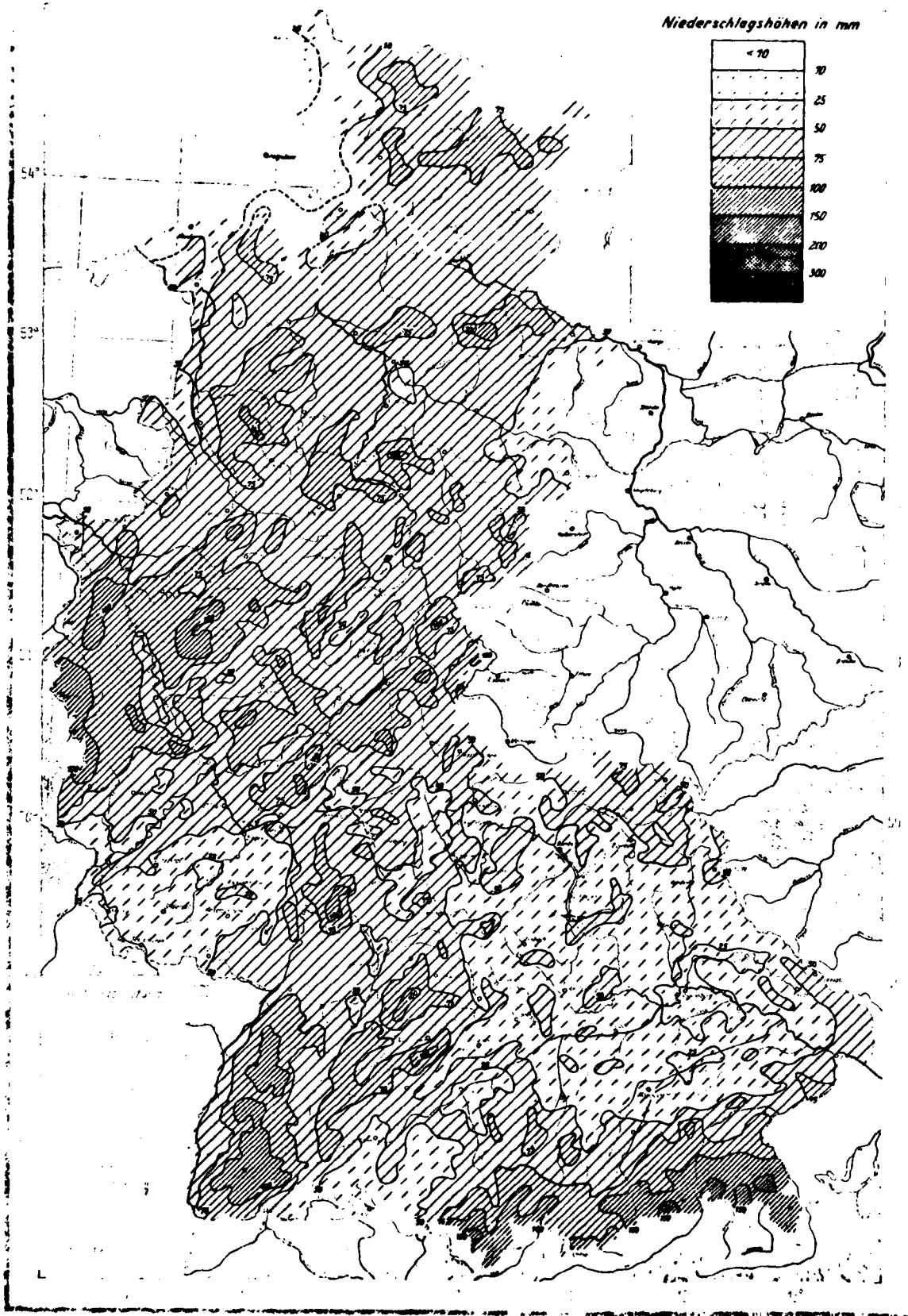
April 1982

Table 1 ctd: Graphical Representation of Meteorological Data
(precipitation in mm)



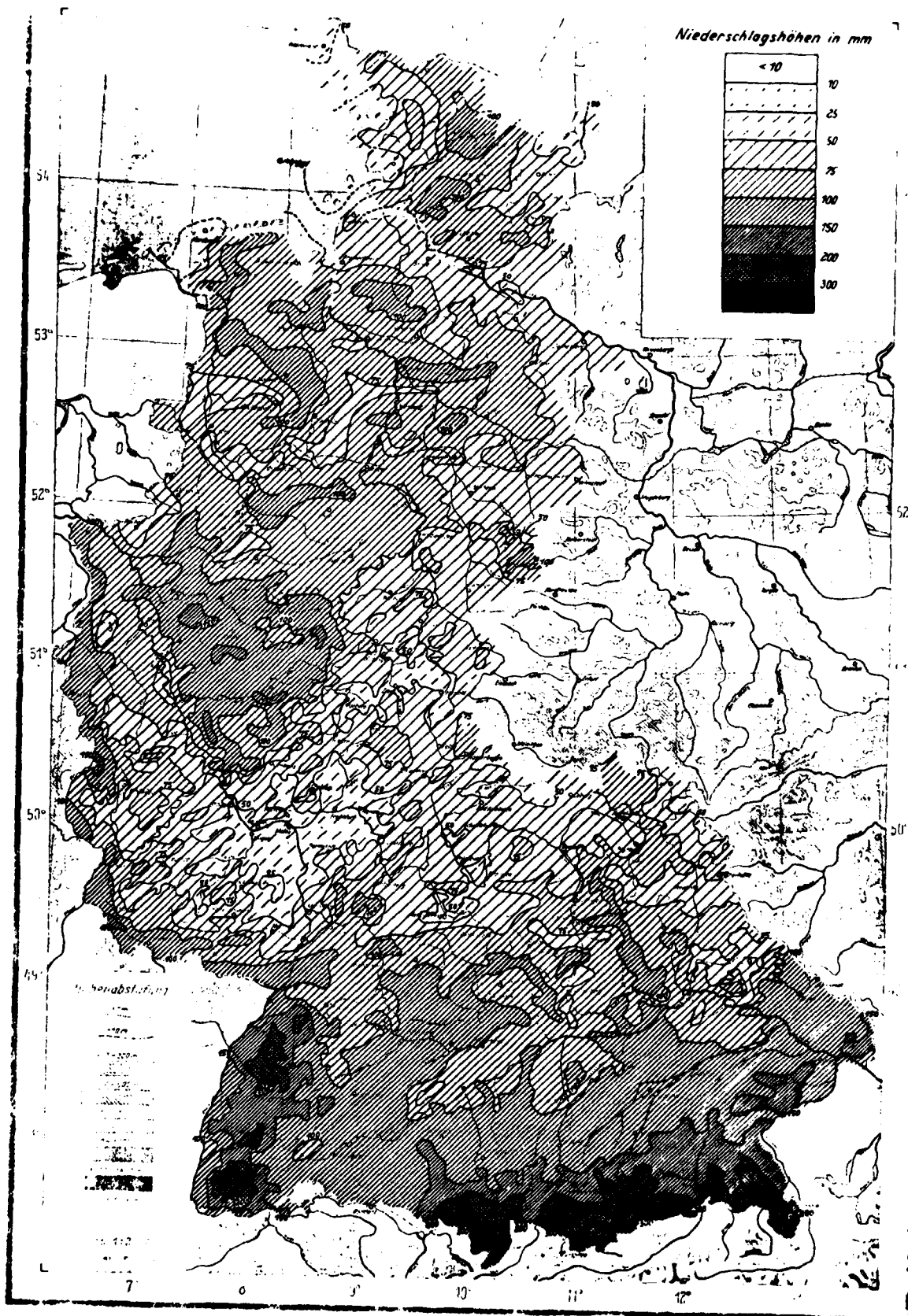
Verteilung der Niederschlagshöhen in mm

Mai 1982



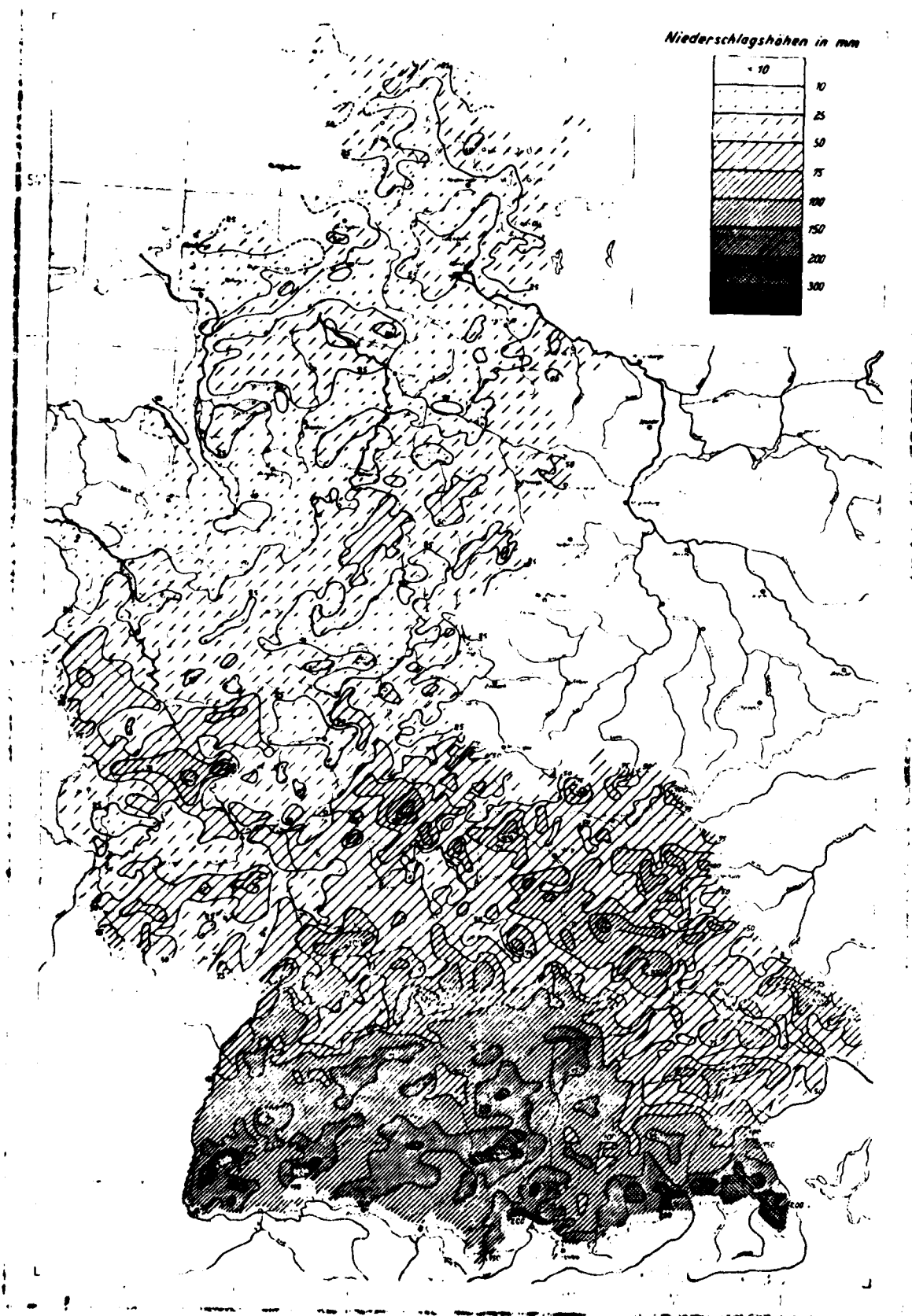
Verteilung der Niederschlagshöhen in mm

Juni 1982



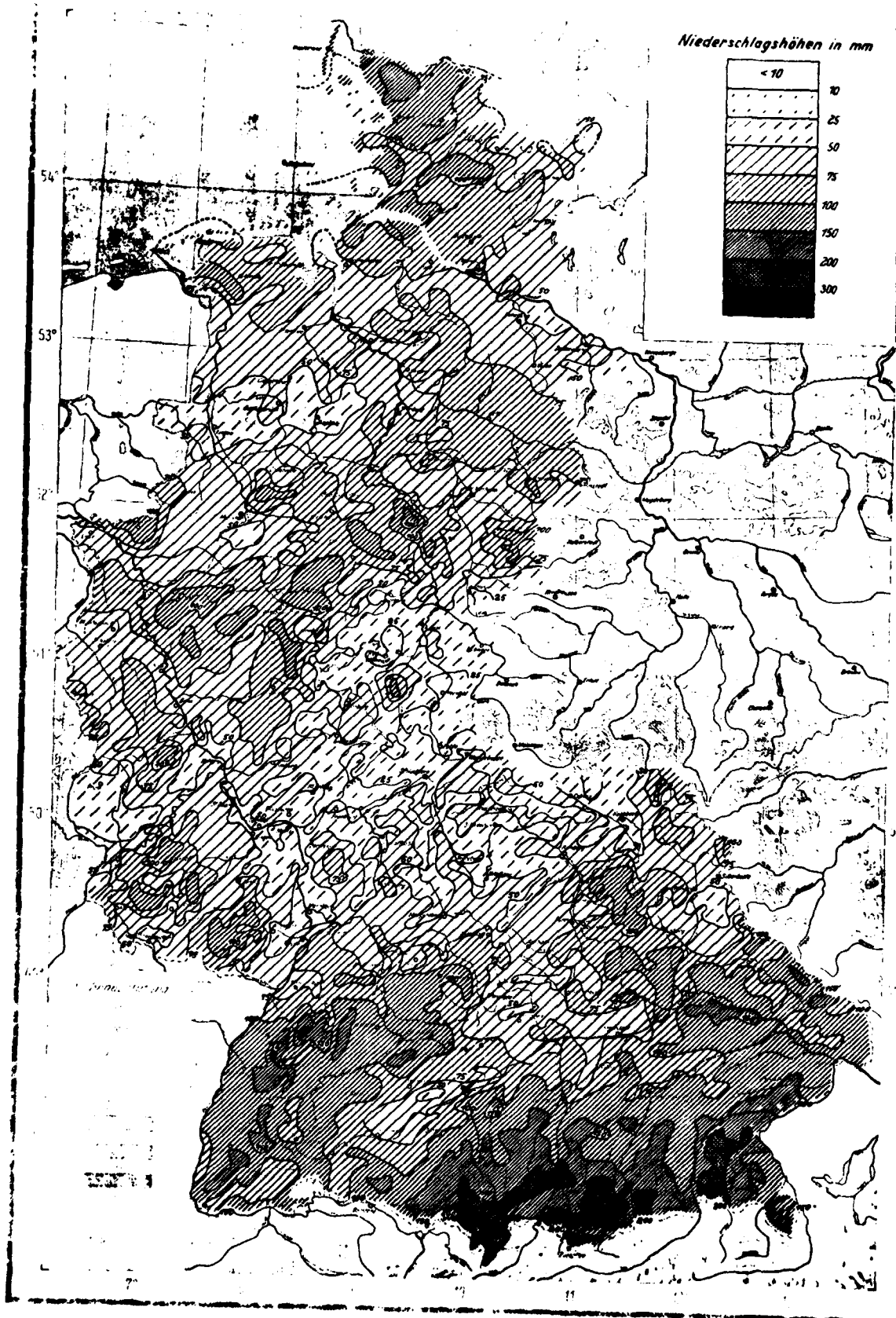
Verteilung der Niederschlagshöhen in mm

Juli 1982



Verteilung der Niederschlagshöhen in mm

August 1982



Verteilung der Niederschlagshöhen in mm

September 1982

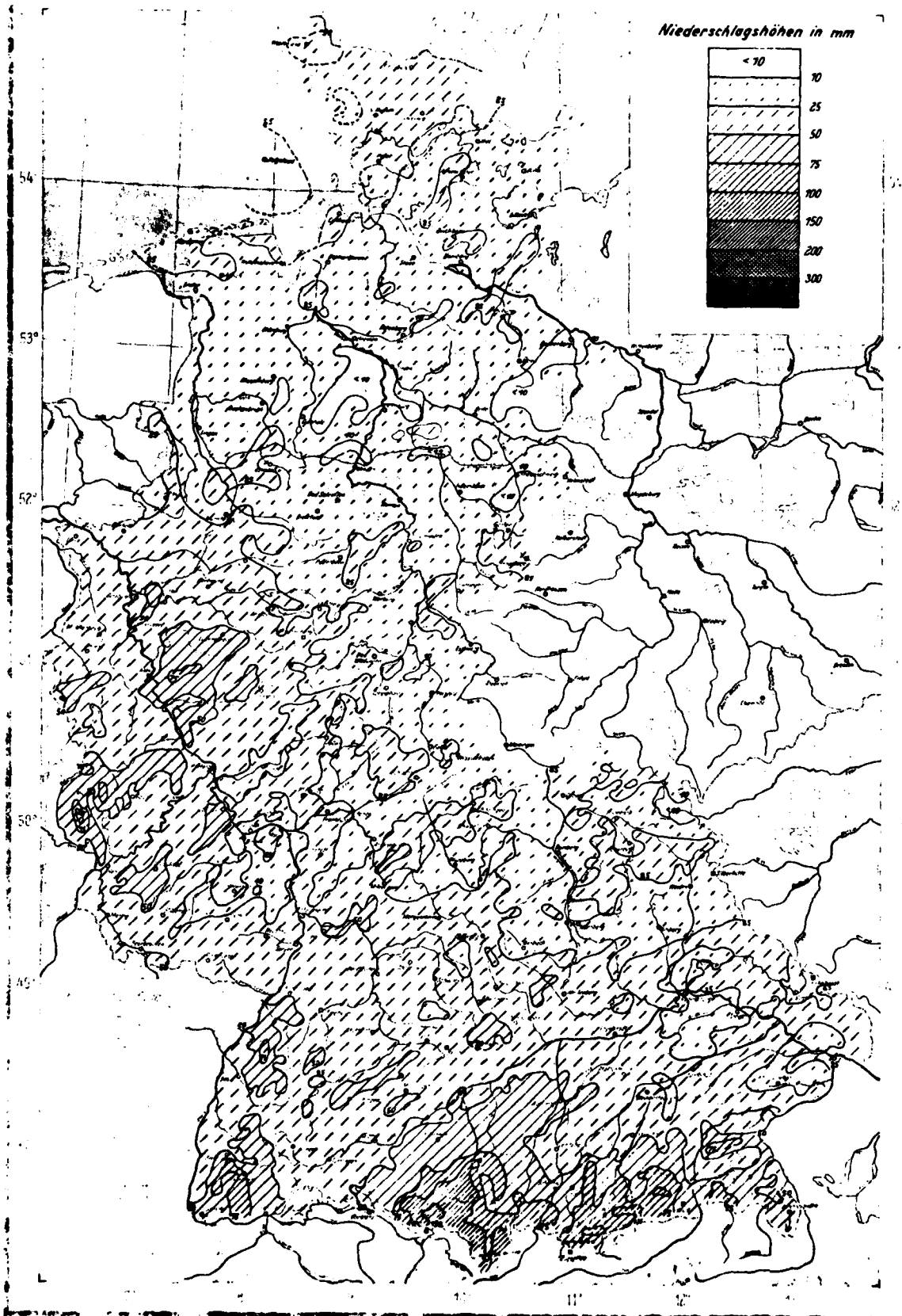
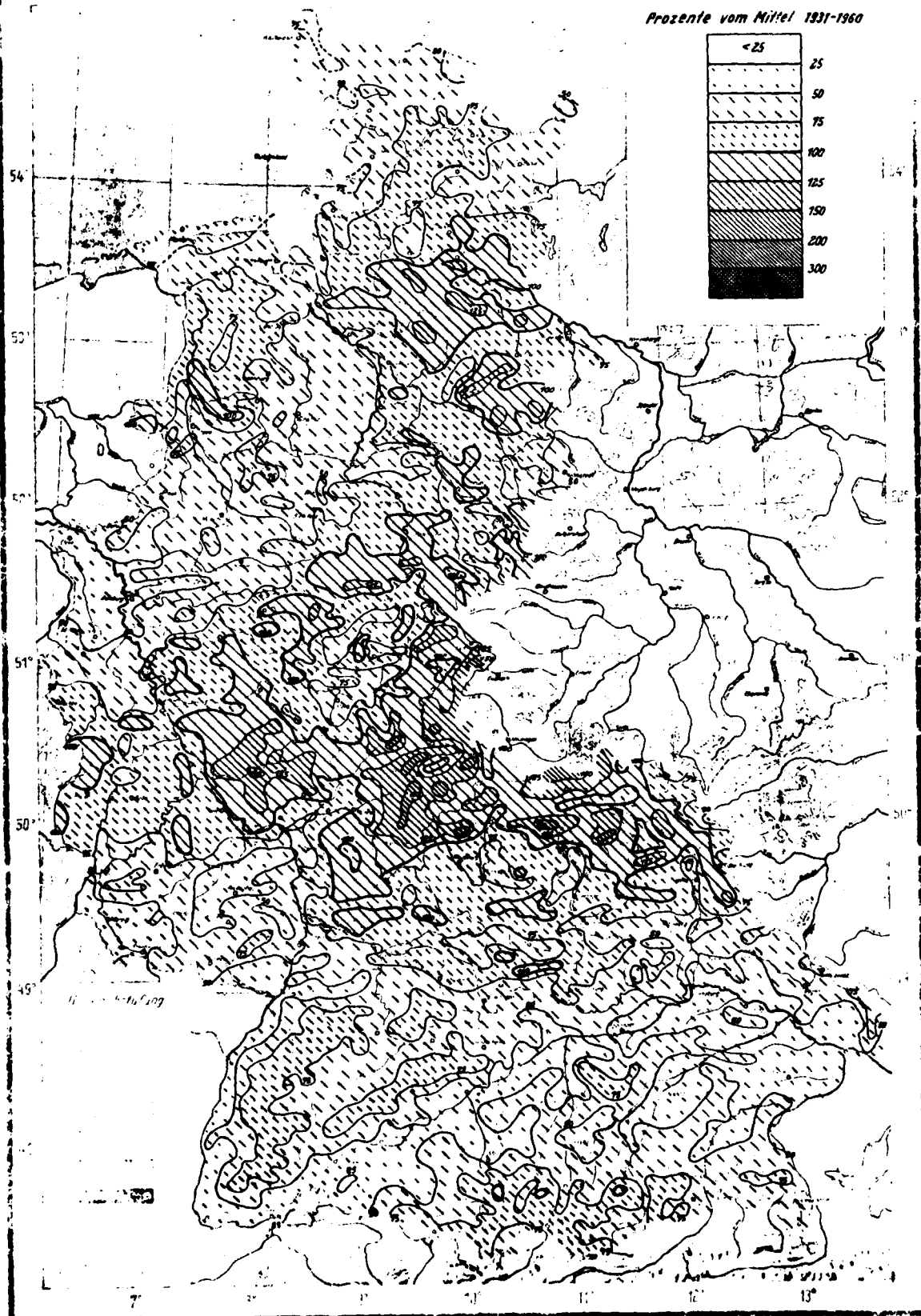
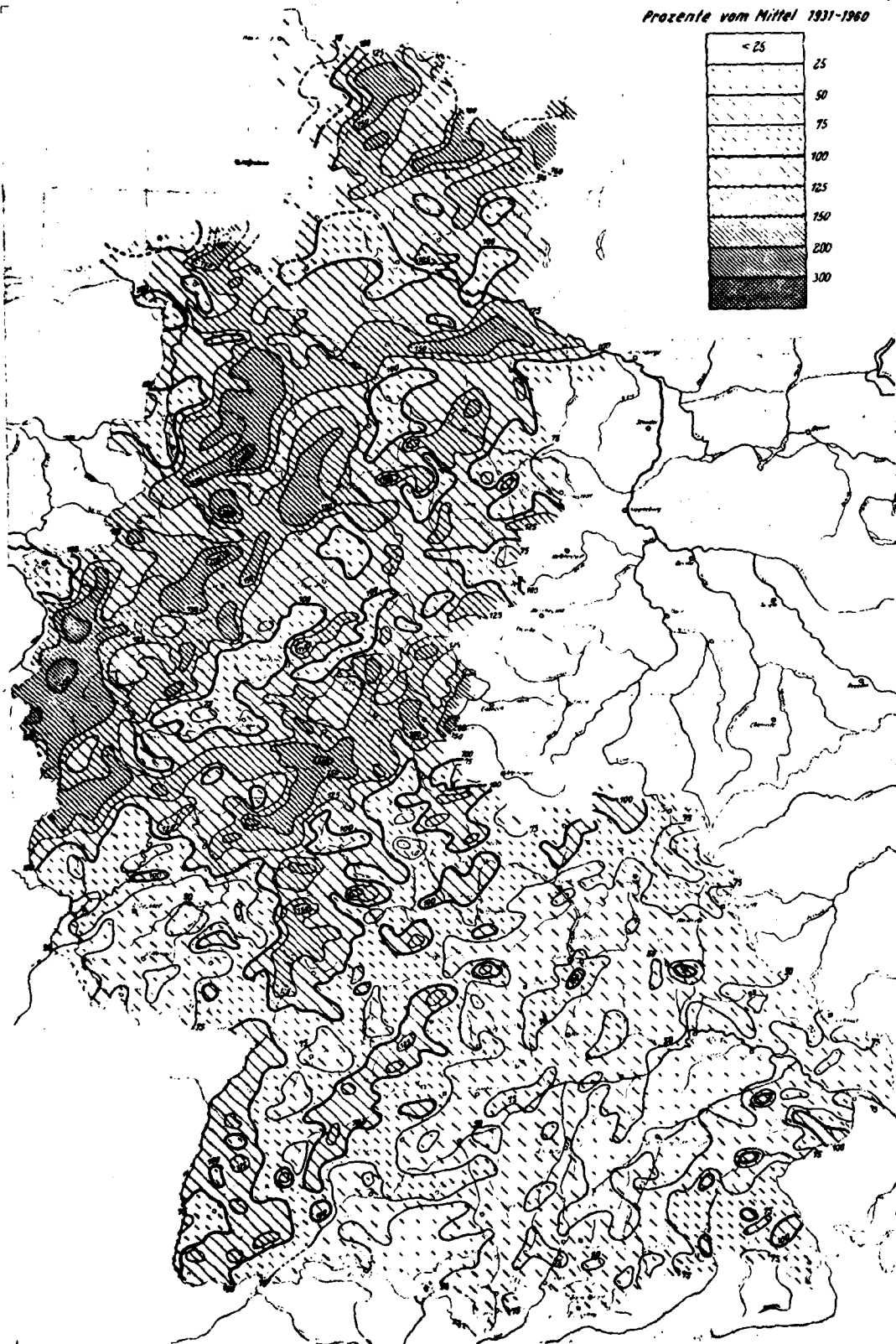


Table 1 ctd: Graphical Representation of Meteorological Data
(precipitation in % of the 1931-1960 mean values)

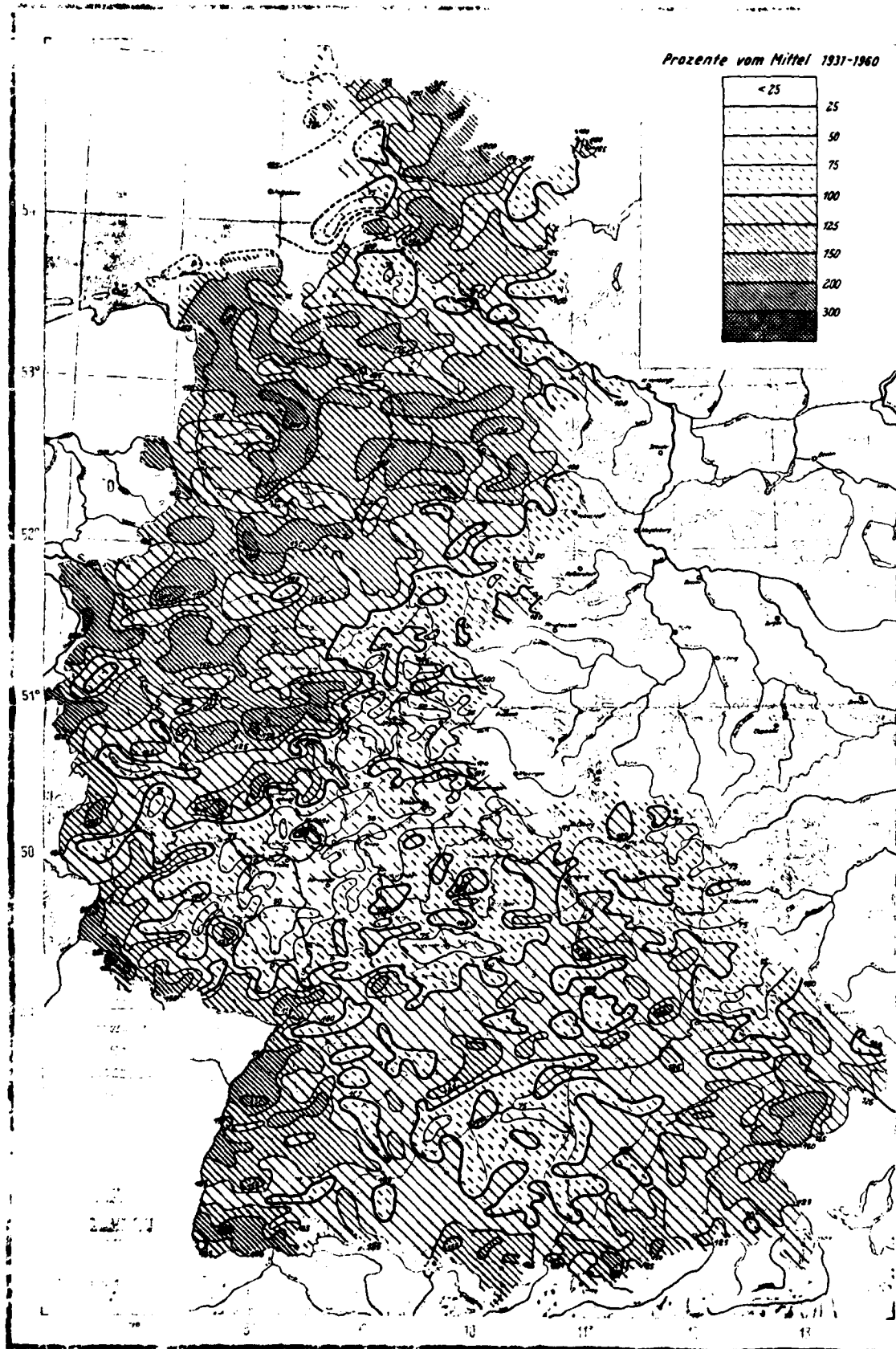
April 1982





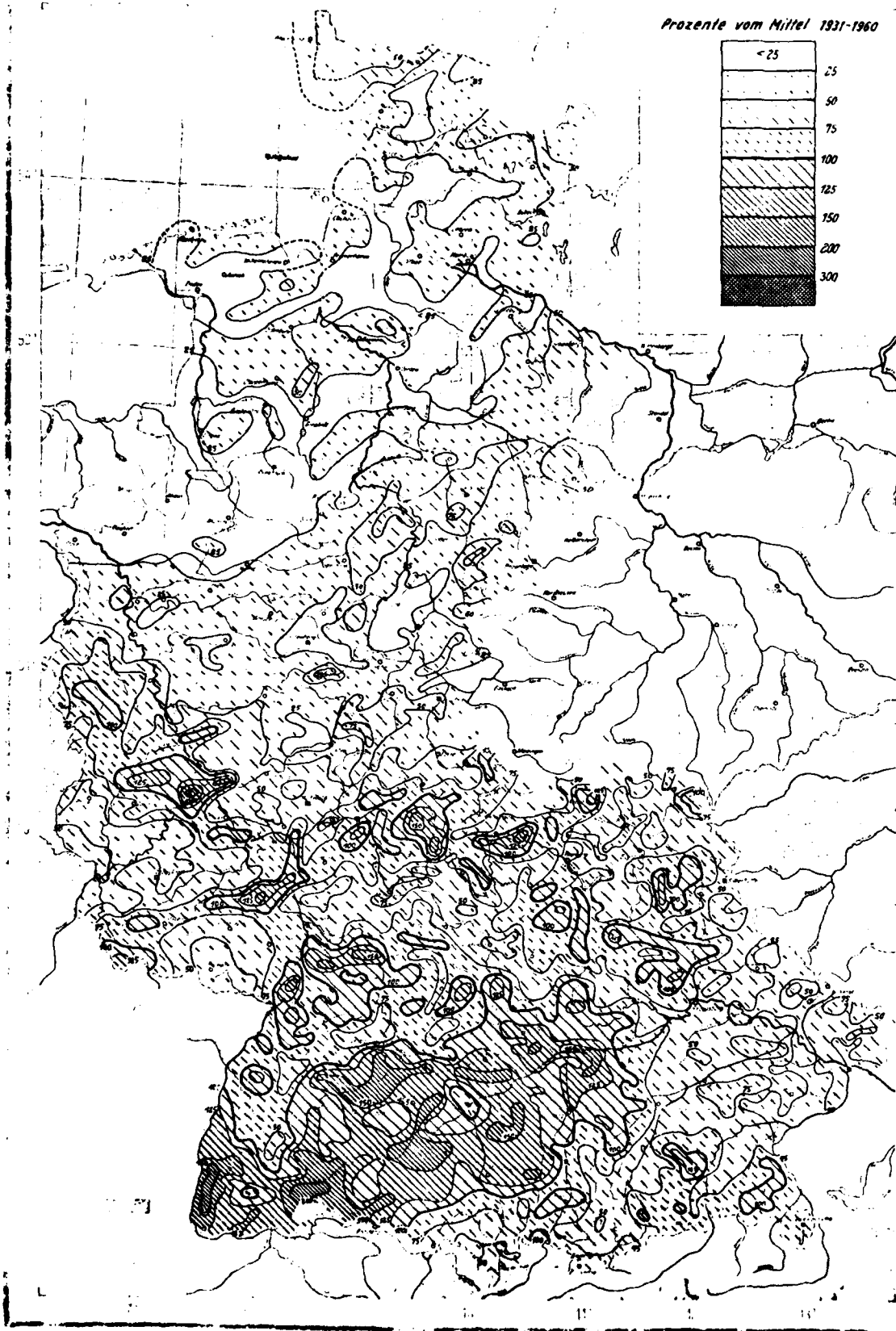
Verteilung der Niederschlagshöhen in %

Juni 1982



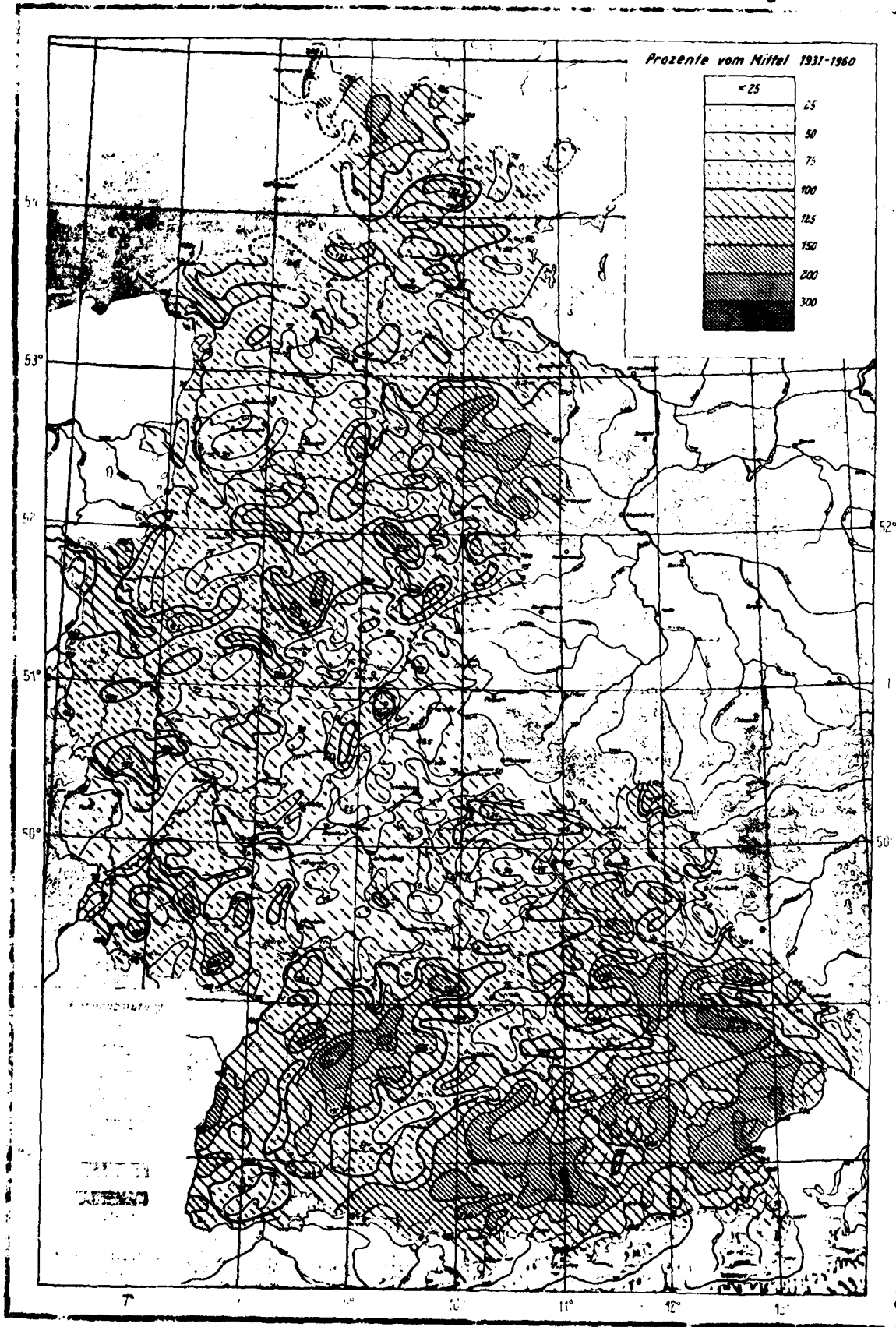
Verteilung der Niederschlagshöhen in %

Juli 1982



Verteilung der Niederschlagshöhen in %

August 1982



Verteilung der Niederschlagshöhen in %

September 1982

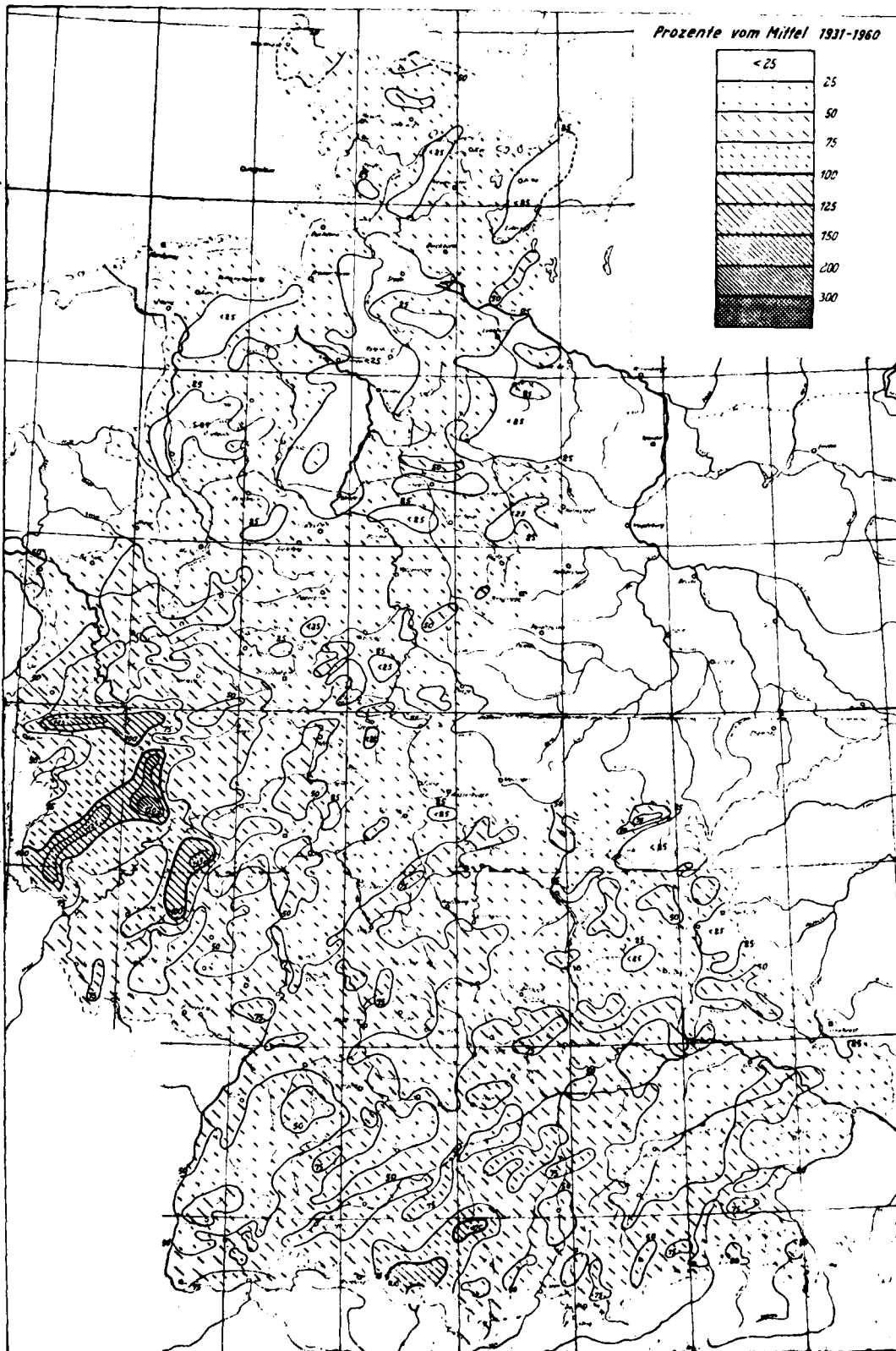


Table 2a: General Land-Use-Classification for the Darmstadt Area (Including Crop Types A and B, Height, and Crop Condition Classes)

No.	General Land-Use/ Crop Type Description/ Height Estimates	Crop Type A Class	Crop Type B Class	Height Class	Crop Condi- tion Class
1	Field trail	24	006	00	0
2	Harrowed	02	001	00	0
3	Freshly harrowed	04	001	00	0
4	Green fodder (rape), H=65cm	15	003	03	1
5	Plowed	01	001	00	0
6	Harrowed	02	001	00	0
7	Freshly harrowed	04	001	00	0
8	Road ditch	24	006	00	0
9	Field trail, asphalt-coated	24	006	00	0
10	Harrowed	02	001	00	0
11	Sugar beets, H= 40 cm	06	007	02	1
12	Harrowed	02	001	00	0
13	Cultivated stubble field	20	001	00	0
14	Freshly harrowed	04	001	00	0
15	Field trail	24	006	00	0
16	Plowed	01	001	00	0
17	Field trail	24	006	00	0
18	Plowed	01	001	00	0
19	Cultivated stubble field	20	001	00	0
20	Cultivated stubble field (rotary hoe)	20	001	00	0
21	Sugar beets, H = 40 cm	06	007	02	1
22	Turnips, H = 50 cm	08	008	02	1
23	Field trail	24	006	00	0
24	Freshly harrowed	04	001	00	0
25	Field trail, asphalt-coated	24	006	00	0
26	Freshly harrowed	04	001	00	0
27	Harrowed	02	001	00	0
28	Freshly harrowed	04	001	00	0
29	Harrowed	02	001	00	0
30	Field trail	24	006	00	0
31	Freshly harrowed	04	001	00	0
32	Harvested potatoes	11	002	00	0
33	Potatoes, H = 40 cm	10	009	02	1
34	Harrowed	02	001	00	0
35	White cabbage	14	011	01	1
36	Freshly harrowed, H = 20cm	04	001	00	0

No.	General Land-Use/ Crop Type Description/ Height Estimates	Crop Type A Class	Crop Type B Class	Height Class	Crop Condi- tion Class
37	Field trail, asphalt-coated	24	006	00	0
38	Harrowed	02	001	00	0
39	Field trail	24	006	00	0
40	Freshly plowed	03	001	00	0
41	Field trail	24	006	00	0
42	Ditch, scattered bushes	23	005	03	0
43	Sowed	05	001	00	0
44	Cultivated stubble field	20	001	00	0
45	Stubble field, H= 5 cm	19	002	01	0
46	Turnips, H = 50 cm	08	008	02	1
47	Sowed	05	001	00	0
48	Field trail, asphalt-coated	24	006	00	0
49	Stubble field, H = 5 cm	19	002	01	0
50	Harrowed	02	001	00	0
51	Sowed	05	001	00	0
52	Plowed	01	001	00	0
53	Field trail	24	006	00	0
54	Field trail	24	006	00	0
55	Ditch, water-filled	24	006	00	0
56	Corn field, H = 2 m	12	010	06	3
57	Stubble field, H = 5 cm	19	002	01	0
58	Piled straw, H = 2 m	24	006	06	0
59	Plowed	01	001	00	0
60	Harrowed	02	001	00	0
61	Field trail	24	006	00	0
62	Freshly plowed	03	001	00	0
63	Turnips, H = 50 cm	08	008	02	1
64	Harrowed	02	001	00	0
65	Idle land (flooded/spoilt turnip crop)	23	005	00	0
66	Ditch	24	006	00	0
67	Field trail, concrete-coated	24	006	00	0
68	Field trail	24	006	00	0
69	Plowed	01	001	00	0
70	Meadow, H = 20 cm	17	003	01	1
71	Cut green fodder, H=5 cm	16	003	01	0
72	Green fodder (rape), H=65 cm	15	003	03	1

No.	General Land-Use/ Crop Type Description/ Height Estimates	Crop Type A Class	Crop Type B Class	Height Class	Crop Condi- tion Class
73	Turnips, H = 50 cm	08	008	02	1
74	Plowed	01	001	00	0
75	Stubble field, H = 5 cm	19	002	01	0
76	Ditch	24	006	00	0
77	Cultivated stubble field	20	001	00	0
78	Field trail	24	006	00	0
79	Meadow/dam slope, H = 20 cm	17	003	01	1
80	Field trail	24	006	00	0
81	Sugar beets, H = 30 cm	06	007	01	1
82	Green fodder (rape), H = 65 cm	15	003	03	1
83	Cut green fodder, H = 5 cm	16	003	01	0
84	Green fodder (rape), H = 65 cm	15	003	03	1
85	Green fodder (rape), H = 65 cm	15	003	03	1
86	Corn, H = 2 m	12	010	06	3
87	Corn, H = 2 m	12	010	06	3
88	Cut corn field, H = 10 cm	13	002	01	0
89	Meadow, H = 20 cm	17	003	01	1
90	Forested bushes, deciduous H=40'-50' (alder trees, willows)	22	004	40/50	2
91	Harrowed	02	001	00	0
92	Plowed	01	001	00	0
93	Corn, H = 2 m	12	010	06	3
94	Field trail	24	006	00	0
95	Green fodder (rape), H = 65 cm	15	003	03	1
96	Harrowed	02	001	00	0
97	Ditch	24	006	00	0
98	Harrowed	02	001	00	0
99	Cut meadow, H = 5 cm	18	003	01	0
100	Plowed	01	001	00	0
101	Harrowed	02	001	00	0
102	Ditch, bushes/single trees	23	005	00	0
103	Field trail	24	006	00	0
104	Harrowed	02	001	00	0
105	Idle land, grass, H = 20 cm	23	003	01	0
106	Idle land, grass, H = 20 cm	23	003	01	0
107	Harrowed	02	001	00	0

No.	General Land-Use/ Crop Type Description/ Height Estimates	Crop Type A Class	Crop Type B Class	Height Class	Crop Condi- tion Class
108	Harrowed	02	001	00	0
109	Field trail	24	006	00	0
110	Sugar beets, H = 30 cm	06	007	01	1
111	Sowed	05	001	00	0
112	Plowed	01	001	00	0
113	Cultivated stubble field, H = 5 cm	20	001	00	0
114	Stubble field, H = 5 cm	19	002	01	0
115	Meadow, H = 20 cm	17	003	01	1
116	Plowed	01	001	00	0
117	Field trail	24	006	00	0
118	Harrowed	02	001	00	0
119	Stubble field, cultivated	20	001	00	0
120	Plowed	01	001	00	0
121	Plowed	01	001	00	0
122	Harrowed	02	001	00	0
123	Harrowed	02	001	00	0
124	Sowed	05	001	00	0
125	Meadow, H = 45 cm	17	003	02	1
126	Stubble field, cultivated	20	001	00	0
127	Harvested potatoes	11	002	00	0
128	Sowed	05	001	00	0
129	Sowed	05	001	00	0
130	Plowed	01	001	00	0
131	Sugar beets, H = 30 cm	06	007	01	1
132	Harrowed	02	001	00	0
133	Harrowed	02	001	00	0
134	Meadow, H = 20 cm	17	003	01	1
135	Idle land, grass/bushes H = 80 - 90 cm	23	005	03	0
136	Forest, deciduous, ash trees H = 90 - 95'	22	004	90/95	3
137	Special area, clearing	24	006	00	0
138	Forest trail	24	006	00	0
139	Young deciduous forest stand, H = 6'	22	004	06	3
140	Young deciduous forest stand, H = 4'	22	004	04	3
141	Harrowed	02	001	00	0

Table 2b: General Land-Use Classification for the Fulda Area (Including Crop Type A and B, Height, and Crop Condition Classes)

No.	General Land-Use/ Crop Type Description/ Height Estimates	Crop Type A Class	Crop Type B Class	Height Class	Crop Condi- tion Class
1	Harrowed	02	001	00	0
2	Field trail, asphalt-coated	24	006	00	0
3	Freshly harrowed	04	001	00	0
4	Harrowed	02	001	00	0
5	Field trail, metalled	24	006	00	0
6	Freshly harrowed	04	001	00	0
7	Harrowed	02	001	00	0
8	Freshly harrowed	04	001	00	0
9	Potatoes, H = 35 cm	10	009	02	1
10	Turnips, H = 45 cm	08	008	02	1
11	Plowed	01	001	00	0
12	Freshly plowed	03	001	00	0
13	Corn, H > 150 cm	12	010	06	1
14	Cut green fodder (lucerne, lupine) H = 20 cm	16	003	01	0
15	Potatoes, H = 35 cm	10	009	02	1
16	Turnips, H = 45 cm	08	008	02	1
17	Corn stubble field, H=10cm	13	002	01	0
18	Corn, H > 150 cm	12	010	06	1
19	Freshly plowed	03	001	00	0
20	Harrowed	02	001	00	0
21	Potatoes, H = 35 cm	10	009	02	1
22	Turnips, H = 45 cm	08	008	02	1
23	Harrowed	02	001	00	0
24	Freshly harrowed	04	001	00	0
25	Field trail	24	006	00	0
26	Cultivated stubble field	20	001	00	0
27	Turnips, H = 45 cm	08	008	02	1
28	Stubble field	19	002	01	0
29	Cut meadow, H = 10 cm	18	003	01	0
30	Drainage ditch	24	006	00	0
31	Harrowed	02	001	00	0
32	Cut meadow, H = 10 cm	18	003	01	0
33	Meadow, H = 30 cm	17	003	01	1
34	Field trail, asphalt-coated	24	006	00	0
35	Field trail, metalled	24	006	00	0

No.	General Land-Use/ Crop Type Description/ Height Estimates	Crop Type A Class	Crop Type B Class	Height Class	Crop Condi- tion Class
36	Sowed	05	001	00	0
37	Cut meadow, H = 10 cm	18	003	01	0
38	Cut meadow, H = 10 cm	18	003	01	0
39	Meadow, H = 30 cm	17	003	01	1
40	Harrowed	02	001	00	0
41	Idle land, grass, H = 20 cm	23	003	01	0
42	Field trail, metalled	24	006	00	0
43	Field trail	24	006	00	0
44	Harvested Potatoes	11	002	00	0
45	Cut meadow, H = 10 cm	18	003	01	0
46	Cut meadow, H = 10 cm	18	003	01	0
47	Sowed	05	001	00	0
48	Harrowed	02	001	00	0
49	Idle land, grass, H = 20 cm	23	003	01	0
50	Sowed	05	001	00	0
51	Harrowed	02	001	00	0
52	Stubble field, H = 5 cm	19	002	01	0
53	Harrowed	02	001	00	0
54	Potatoes, H = 35 cm	10	009	02	1
55	Harrowed	02	001	00	0
56	Stubble field, H = 5 cm	19	002	01	0
57	Field trail	24	006	00	0
58	Meadow, H = 25 cm	17	003	01	1
59	Stubble field with drain- ages, H = 5 cm	19	002	01	0
60	Harrowed	02	001	00	0
61	Forest, deciduous (oak 80%, beech 20%), H = 60 cm	22	004	60	2
62	Meadow, H = 15 cm	17	003	01	1
63	Field trail	24	006	00	0
64	Corn, H = 180 cm	12	010	06	2
65	Corn stubble field, H=10cm	13	002	01	0
66	Meadow, H = 15 cm	17	003	01	1
67	Ditch	23	005	00	0
68	Secondary road, asphalt- coated	24	006	00	0
69	Plowed	01	001	00	0
70	Meadow, H = 15 cm	17	003	01	1

No.	General Land-Use/ Crop Type Description/ Height Estimates	Crop Type A Class	Crop Type B Class	Height Class	Crop Condi- tion Class
71	Cut green fodder, H = 5 cm	16	003	01	0
72	Meadow, H = 35 cm	17	003	02	1
73	Stubble field, H = 5 cm	19	002	01	0
74	Freshly plowed	03	001	00	0
75	Field trail, metalled	24	006	00	0
76	Field trail, asphalt-coated	24	006	00	0
77	Cut meadow, H = 5 cm	18	003	01	0
78	Former silo area	24	006	00	0
79	Silo, H = 2 m	24	006	06	0
80	Meadow, H = 25 cm	17	003	01	1
81	Meadow, H = 25 cm	17	003	01	1
82	Cut Meadow, H = 5 cm	18	003	01	0
83	Stubble field, H = 5 cm	19	002	01	0
84	Idle land, grass, H = 35 cm	23	003	02	0
85	Field trail with ditch	24	006	00	0
86	Cut meadow, H = 5 cm	18	003	01	0
87	Pasture, H = 20 cm	21	003	01	1
88	Railway dam slope, idle land, H = 20 cm	24	006	01	0
89	Pasture, H = 20 cm	21	003	01	1
90	Field trail	24	006	00	0
91	Cut meadow, H = 5 cm	18	003	01	0
92	Plowed	01	001	00	0
93	Meadow, H = 25 cm	17	003	01	1
94	Cut Meadow, H = 5 cm	18	003	01	0
95	Plowed	01	001	00	0
96	Stubble field, H = 5 cm	19	002	01	0
97	Harrowed	02	001	00	0
98	Field trail, metalled	24	006	00	0
99	Secondary road, asphalted	24	006	00	0
100	Coniferous forest stand, pines, H = 70'	22	004	70	1
101	Harrowed	02	001	00	0
102	Harrowed	02	001	00	0
103	Cut meadow, H = 5 cm	18	003	01	0
104	Harrowed	02	001	00	0
105	Turnips, H = 45 cm	08	008	02	1
106	Freshly harrowed	04	001	00	0

No.	General Land-Use/ Crop Type Description/ Height Estimates	Crop Type A Class	Crop Type B Class	Height Class	Crop Condi- tion Class
107	Freshly plowed	03	001	00	0
108	Corn, H = 180 cm	12	010	06	2
109	Harrowed	02	001	00	0
110	Field trail	24	006	00	0
111	Shed, scattered trees, H = 17'	24	006	17	0
112	Plowed	01	001	00	0
113	Harrowed	02	001	00	0
114	Harrowed, spotted animal fertilizer	02	001	00	0
115	Cut meadow, H = 5 cm	18	003	01	0
116	Pasture, spotted animal fertilizer, H = 25 cm	21	003	01	1
117	Forest, deciduous, alder trees, H = 55'	22	004	55	2
118	Forest, coniferous, spruce, H = 75'	22	004	75	2
119	Field trail	24	006	00	0
120	Meadow, H = 30 cm	17	003	01	1
121	Meadow, H = 30 cm	17	003	01	1
122	Cut meadow, H = 5 cm	18	003	01	0
123	Cut meadow, H = 5 cm	18	003	01	0
124	Harrowed	02	001	00	0
125	Harrowed, fertilized	02	001	00	0
126	Potatoes, H = 35 cm	10	009	02	1
127	Harvested potatoes	11	002	00	0
128	Cabbage, H = 20 cm	14	011	01	1
129	Harrowed	02	001	00	0
130	Turnips, H = 45 cm	08	008	02	1
131	Harvested turnips	09	002	00	0
132	Harrowed	02	001	00	0
133	Field trail, metalled	24	006	00	0
134	Field trail	24	006	00	0
135	Harrowed	02	001	00	0
136	Harrowed	02	001	00	0
137	Stubble field, H = 5 cm	19	002	01	0
138	Harrowed	02	001	00	0
139	Cultivated stubble field	20	001	00	0
140	Cultivated stubble field	20	001	00	0
141	Forest, coniferous, pines H = 27'	22	004	27	2

Table 3: Crop Type A Classification

Code No.	Crop Type
01	Plowed field
02	Harrowed field
03	Freshly plowed field
04	Freshly harrowed field
05	Sowed
06	Sugar beets
07	Harvested sugar beets
08	Turnips
09	Harvested turnips
10	Potatoes
11	Harvested potatoes
12	Corn
13	Harvested corn
14	White cabbage
15	Green fodder (rape); beef-raising crop
16	Cut green fodder (cut rape)
17	Meadow
18	Cut meadow
19	Stubble field
20	Cultivated stubble field
21	Pasture
22	Forest
23	Idle land
24	Special areas (trails, sheds, etc.)

Table 4: Crop Type B Classification

Code No.	Crop Type
001	Freshly cultivated soils, cultivated stubble fields
002	Harvested truck crops, stubble fields
003	Meadows (incl. recently cut ones), pastures, green fodder/rape (incl. recently cut ones)
004	Forest
005	Idle land
006	Special areas (roads, trails, railways, buildings, etc.)
007	Sugar beets
008	Turnips
009	Potatoes
010	Corn
011	White cabbage

Table 5: Crop/Vegetation Height

Code No.	Crop/Vegetation Height
00	No crop/vegetation
01	> 0 - 30 cm
02	> 30 - 60 cm
03	> 60 - 90 cm
04	> 90 - 120 cm
05	> 120 - 150 cm
06	> 150 cm

Table 6: Crop/Vegetation Condition

Code No.	Crop/Vegetation Condition
0	No crop/vegetation
1	Poor
2	Normal
3	Good

Table 7: Growth Heights of the Most Important Plants in Germany

		Growth Height (cm)											
		Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Cereals	winter barley	-	-	-	10-15	20-40	40-100	100	-	-	-	-	-
	winter rye	-	-	-	10-15	20-45	45-120	120	-	-	-	-	-
	winter wheat	-	-	-	10-15	20-40	40-100	100	100	-	-	-	-
	summer barley	-	-	-	10	20-40	40-90	90	90	-	-	-	-
	Oat	-	-	-	10	20-40	40-90	90	90	-	-	-	-
Truck crops	sugar beets	-	-	-	10	10-30	30-40	40	40	40	40	40	-
	potatoes	-	-	-	-	10	10-30	30-50	50	50	20-30	-	-
	rape	-	-	-	20	20-50	50-120	100	100	-	-	-	-
	corn	-	-	-	-	0-10	10-60	60-100	100-200	200	200	-	-
Field fodder	turnips	-	-	-	10-15	15-50	50-60	60	60	60	-	-	-
	green fodder (incl. green dung)	-	-	-	-	-	-	-	0-10	10-30	20-30	20-30	-
Meadows, pastures	grasses (incl. herbs)	10	10	10	10	10-30	30-50	10-20	20-40	10	10	10	10

Table 8: Classification of Agricultural Areas for the Groß-Gerau and Fulda Districts

Lande use District	Agricultural Area	Green Fodder/ Green Land	Cereals	Truck Crops	Forest	Miscell.
Groß-Gerau (incl. Darmstadt flight line area)	19494 ha 100 %	3472 ha 17.8 %	12074 ha 62.0 %	3189 ha 16.3 %	-	759 ha 3.9 %
Fulda (incl. Fulda flight line area)	66030 ha 100 %	36710 ha 55.7 %	25723 ha 38.9 %	3163 ha 4.8 %	-	344 ha 0.6 %

Table 9: Structure of the Agriculturally Used Areas in Germany

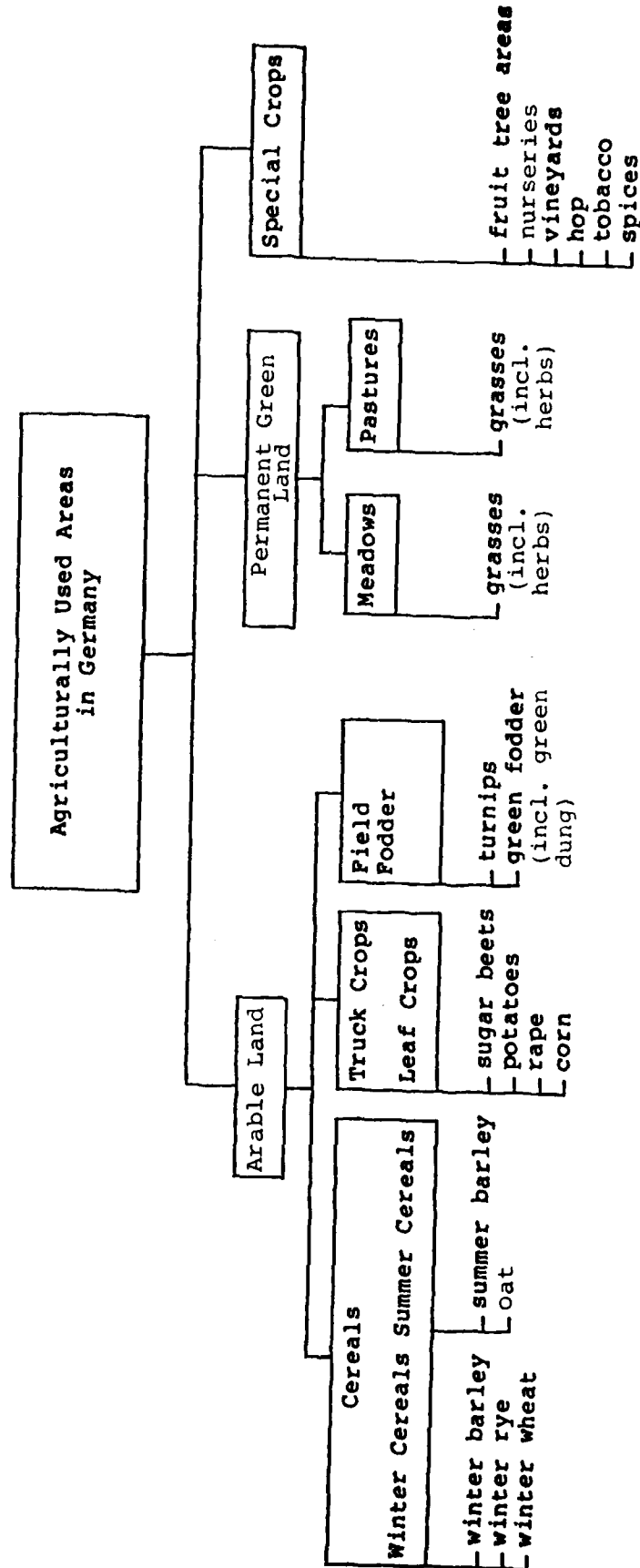
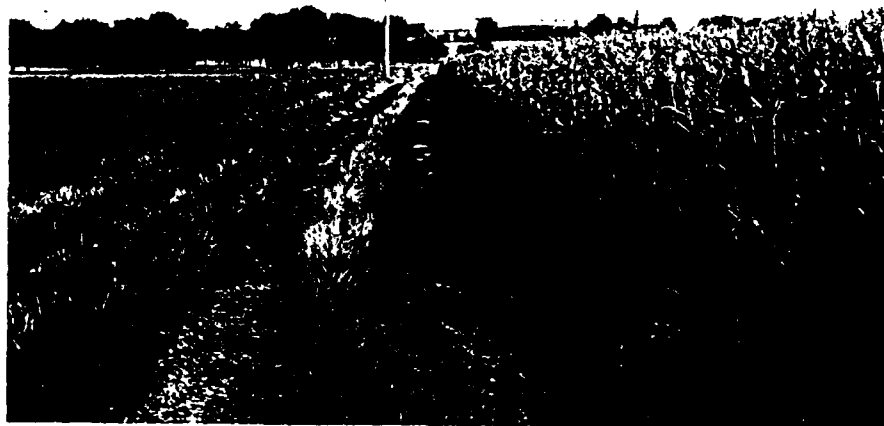


Table 10: Planting and Harvesting Dates for the Most Important Plants in Germany

P l a n t		Date of Planting	Date of Harvesting
Cereals	winter barley	September	July
	winter rye	October	August
	winter wheat	Oct./Nov.	August
	summer barley	March/April	August
	oats	March/April	August
Truck crops	sugar beets	March/April	Sept./Dec.
	potatoes	April	July/October
	winter rape	August	July
	summer rape	April	August
	corn	April/May	October
Field fodder	turnips	March/April	September
	green fodder	July/August	Oct./Nov.
	green dung	July/August	Oct./Dec. +)
Meadows, pastures	grasses (incl. herbs)	-	June + August

+) Harvesting means plowing here



Photograph 1: Typical Corn Field Along Field Trail



Photograph 2: Barrel-shaped Turnip (Typical Growth Above
Ground Level)
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Photograph 3: Sugar Beet Field (Row-arranged) with Turnip Edges (Non-row-arranged)



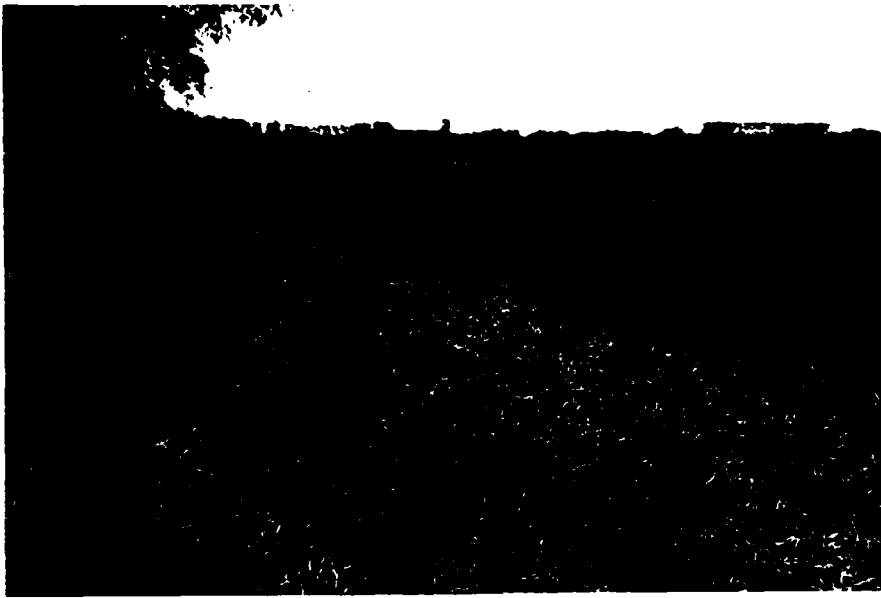
Photograph 4: Rape Field



Photograph 5: Soil-Cultivation at Various Stages (Upper
Right: Plow-harrowed area; Left: Plowed Area;
Centre: Harrowing with Farm Implement)



Photograph 6: Rotary-plowed Field (On the Left)



Photograph 7: Plow-harrowed Field (After Burning of Stubbles)



Photograph 8: Plow-harrowed Field



Photograph 9: Plowed (On the Left) and Harrowed Soil Condition



Photograph 10: Plow-harrowed Soil (On the Right) with Neighbouring Sugar Beet Field (On the Left)



Photograph 11: Plow-harrowed Soil Next to Potatoe and Sugar Beet Fields



Photograph 12: Plow-harrowed Soil (Extremely Hard Surface Condition)



Photograph 13: Plow-harrowed Soil



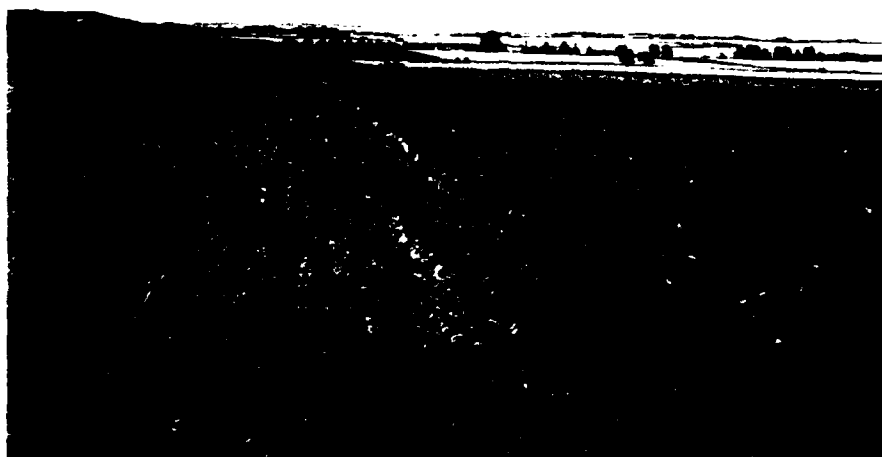
Photograph 14: Plow-harrowed Soil



Photograph 15: Stubble Field (Left: Plow-harrowed After Burning; Centre: Condition Prior to Burning; Right: Condition After Burning)



Photograph 16: Rotary-plowed Soil



Photograph 17: Shallow-plowed Soil (Left) with Neighbouring Sugar Beet Field



Photograph 18: Rape Field



Photograph 19: Sugar Beet Field with Turnip Edge (Right-hand Border)

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