

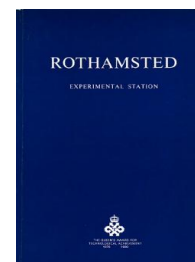
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ROTHAMSTED
RESEARCH

Rothamsted Experimental Station Guide

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Weather

Rothamsted Research

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plots of Park Grass (21), with pH of 5.0–5.5. The old practice of excavating the underlying chalk and spreading it on the surface of arable fields gave them small reserves of calcium carbonate. Fields that follow our usual rotation of crops are limed once in 7 years to maintain an average pH value of 7.0. A few areas are deliberately kept acid.

The Classical experiments (see below) provide extremes of depletion and enrichment of P and K. Typical amounts are:

Field	Treatment since about 1850*	In soil now (mg kg ⁻¹)	
		P	K
Agdell	Nil	2	90
	PK	10	170
Barnfield	Nil	23	180
	PK	64	640
Broadbalk	Nil	8	100
	PK	80	360
Hoos Barley	Nil	5	90
	PK	130	430
Park Grass	Nil	5	60
	PK	130	670

* Amounts applied and periods differ from experiment to experiment.
 Note: P is NaHCO₃-soluble; K is exchangeable.

WEATHER RECORDS

The meteorological enclosure is in Great Field. In addition to the measurements returned to the Meteorological Office, others are made that are specially needed for agriculture or for use with the field experiments.

The observations cover a long period: rainfall (since 1852), drainage through bare soil, 20, 40 and 60 in. deep (50, 100 and 150 cm) (since 1870), air temperature (since 1878), and sunshine (since 1891). Rain, drainage, temperature, sunshine and radiation are continuously recorded. Daily observations include temperature measurements in the soil, under bare soil and turf, at

TABLE 1

Rothamsted weather: 10-year averages 1970–79 (and 1976 temperatures and rainfall in brackets)

	Mean air temperature °C	Rain (mm) (1)	Drainage (mm) (2)	Evaporation (mm) (3)	Sunshine (hours)	Daily solar radiation MJm ⁻² d ⁻¹ (4)
January	3.4 (4.9)	74 (27)	64	8	42	1.9
February	3.6 (3.9)	59 (26)	48	10	63	3.9
March	5.1 (4.5)	62 (18)	38	27	106	7.5
April	7.3 (7.6)	51 (22)	20	49	129	11.2
May	11.0 (12.1)	52 (22)	18	83	196	16.2
June	13.9 (17.2)	57 (17)	16	99	201	17.4
July	16.0 (18.5)	34 (42)	3	103	190	16.0
August	16.0 (17.5)	55 (9)	14	91	180	13.4
September	13.5 (13.5)	58 (106)	20	69	148	10.1
October	10.2 (10.5)	56 (123)	31	34	103	5.7
November	6.1 (5.7)	75 (83)	53	16	74	3.0
December	4.6 (1.5)	71 (87)	58	8	45	1.7
Total or mean	9.2 (9.8)	704 (582)	383	597	1477	9.0
Equivalent to	49°F (50°F)	27.7 in. (22.9 in.)	15.1 in.	23.5 in.		

Notes—(1) 1/1000th acre (0.0004 ha) gauge.
 (2) Through 20 in. (50 cm) bare soil.
 (3) Open water. 6 × 6 ft (1.8 × 1.8 m) sunken tank.
 (4) Total (Kipp).

various depths down to 4 ft (1.2 m), at the tips of growing grass (grass minimum) and at screen height in the air (maximum, minimum, dry bulb and wet bulb).

Table 1 gives average weather at Rothamsted for the 10 years 1970–79. Some values for 1976 are included to illustrate an extreme deviation from the long-term pattern. A summary of the weather records for both Rothamsted and Woburn is given in the *Rothamsted Report for 1979*, Part 2.

THE FARM

The Rothamsted Home Farm of 100 hectares came under the management of Sir John Lawes in 1834. In 1843, and after, he assigned part of it to the field experiments on wheat, barley and grass now known as the Classical experiments. Although some land was sometimes in other occupation, Lawes always retained control of the experimental fields, which in his day were worked from farm buildings near the Manor House. These Classical Fields were made over on a 99 years' lease to the Lawes Agricultural Trust on its foundation in 1889, and have since been bought. More land has been acquired from the original home farm, and the adjoining Scout Farm, Redbourn, was bought in 1965. Today the estate, including woodlands, totals 330 ha of which 262 ha are farmed.

Classical experiments, long-term rotation experiments and crop-sequence experiments occupy the same sites every year. There are about 800 Classical plots which occupy about 16 ha. Rotation, crop-sequence and annual experiments total about 3000 large plots. In addition about 1600 plots are used for microplot experiments. One and a quarter hectares near the Laboratory, known as the Garden Plots, and approx. 9 ha on the farm, are used for small-plot experiments which cannot conveniently be done by farm equipment.

Organisation and staffing

The Working Party for Field Experiments plans the programme of field experiments. Detailed instructions are drawn up by the Field Experiments Section and passed to the Head of Farms. The Head of Farms, aided by two assistants at Rothamsted and a bailiff at Woburn, is responsible for the field work in connection with experiments and all matters relating to the farms. A team of recorders, responsible to the Head of Farms, is responsible for marking out the experiments, supervising all field operations on experimental plots, and recording yields. The Field Experiments Section maintains liaison between farm staff and the research workers. The Statistics Department analyses results of the experiments which are published each year.

The Farm staff consists of five tractor drivers, one general worker, a stockman/tractor driver, a mechanic and a building maintenance worker. The regular staff is supplemented by casual labour for potato picking and roguing wild oats in cereals.

Cropping

Of the 262 ha farmed, about 190 ha are under arable cropping. Much of the farm is worked on a 7-year rotation of two cereals, one break crop, two cereals, two break crops, to provide a choice of sites for cereals with different probabilities of attack by soil-borne pathogens. Several fields outside the rotation are not given P, K or lime. This is to provide sites