Woburn long-term liming experiment lime and fertilizer treatments 1962-1996

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Description: Contains details of the lime applications, fertilizer treatments and basal fertilizer applied to the Long-term Liming Experiment at Woburn, 1962-1996.

1) Details of lime application dates and amounts applied, 1962-1996.
2) Details of fertilizer treatments (P, K, Mg, Mn and S), application amounts, dates and forms, 1962-1996.
3) Details of basal fertilizer (N, K and Mg), application amounts and forms, 1962-1996.

Site: W/CS/10. Stackyard field Section 3, Woburn Experimental Farm, Husborne Crawley, Woburn, Bedfordshire, UK. Latitude 52.0003, Longitude -0.6149

Related Resources:

- Woburn long-term liming experiment standard plans, 1962-1996 10.23637/wcs10-Plans
- Refer to website for more details: http://www.era.rothamsted.ac.uk/

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Woburn Long-term Liming experiment. **W/CS/10**
Lime application dates and amounts **1962-1996**

Woburn (Stackyard) total lime applied, 1962-1987: **Ground chalk ($CaCO_3$) tha^{-1}**

Harvest Year	1962	1963	1979	1982	1983	1987
Date applied	09/03/1962	19/10/1962	21/11/1978	25/11/1981	04/11/1982	13/11/1986
Lime Treatment						
None (0)	0	0	0	0	0	0
Low (L)	5	0	1	2	0	1
Medium (M)	10	2	2	5	5	1.5
High (H)	15	4	4	10	10	2.5

Summary of total lime applied, 1962-1987, Ground chalk ($CaCO_3$) tha^{-1}:

Lime Treatment	Rothamsted	Woburn
0	0	0
L	15	9
M	24.5	25.5
H	52.5	45.5

Lime applied in 1962 and 1963 was local soft cretaceous ground limestone (chalk).
It contained 34.8% Ca and 0.2% Mg soluble in HCl (Bolton 1977).

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Bolton, 1977: DOI: https://doi.org/10.1017/S0021859600027222

Woburn Long-term Liming experiment. **Fertilizer treatments**

W/CS/10 **1962-1996**

Year	P treatments kgP/ha 0	P	Date P, K and Mg applied	K treatment kgK/ha 0	K	Mg treatment kgMg/ha 0	Mg
1962	0	27.5	15/03/1962	0	104		
1963	0	27.5	13/03/1963	0	104		
1964	0	27.5	08/11/1963	0	104		
1965	0	27.5	29/03/1965	0	104		
1966	0	27.5	10/03/1966	0	104		
1967	0	27.5	24/02/1967	0	104		
1968	0	55	28/03/1968	0	156		
1969	0	0	-	0	0		
1970	0	27.5	26/03/1970	0	104		
1971	0	27.5	04/03/1971	0	104		
1972	0	27.5	14/03/1972	0	104		
1973	0	27.5	28/02/1973	0	104		
1974	0	55	16/04/1974	0	156	0	112
1975	0	27.5	17/03/1975	0	105	0	0
1976	0	27.5	26/03/1976	0	105	0	112
1977	0	27.5	18/03/1977	0	105	0	112
1978	0	27.5	13/03/1978	0	105	0	112
1979	0	0	-	0	0		
1980	0	0	-	0	0		

	Divided into 4 P treaments: P0	P1	P2	P3	Date P applied	Mn treatment kgMn/ha 0	Mn	S treatment kgS/ha 0	S
1981	0	25	25	75	08/12/1980				
1982[$]	0	25	0	25	24/03/1982				
1983	0	50	50	100	22/03/1983				
1984	0	0	0	0	-				
1985	0	0	0	0	-				
1986	0	0	0	0	-				
1987	0	0	0	0	-	0	0.76		
1988	0	25	25	75	10/02/1988	0	0.31		
1989	0	0	0	0	-	0	0.29		
1990	0	0	0	0	-	0	0.10*		
1991	0	0	0	0	-			0	30
1992	0	0	0	0	-			0	30
1993	0	0	0	0	-			0	0
1994	0	0	0	0	-			0	30
1995	0	0	0	0	-			0	30
1996	0	0	0	0	-			0	30

Phosphorus (P) treatments:

From 1962-1980 two P treatments (0, P)

1962-1978 Applied as superphosphate. Not applied to fallow (1969, 1979, 1980)

1968, 1974 55 kgP/ha to potatoes

From 1981 onwards divided into four P treaments (P0, P1, P2, P3):

1981-83, 1988 Applied as superphosphate

1982[$] Possibly 50kgP/ha. In most Yield Books P1 and P3 shown as 25kgP/ha, on Field Plans shown as 50kgP/ha

Potassium (K) treatment:

1962-1978 Applied as potassium chloride

1981 onwards Basal application to all plots in some years

Magnesium (Mg) treatment:

1974, 1976-78 Applied as Epsom salts (1974, 1976-77) and kieserite (magnesium sulphate) (1978)

1981 onwards Basal application to all plots in some years

Manganese (Mn) treatment:

1987-1990	Divided into two applications of liquid foliar fertilizer at fourth leaf stage (usually May/June) and before flowering (usually June/July). *First dose only applied in 1990 as crop failed

Sulphur (S) treatment:

1991-1996	Applied as calcium sulphate. Not applied in 1993 as crop failed

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Woburn Long-term Liming experiment. **Basal Fertilizer**
W/CS/10 1962-1996 (applied to all plots, not a treatment factor)

	Fertilizer N			
	kgN/ha	Type		
Year	Woburn	Woburn		
1962	0			
1963	0			
1964	32	Nitrochalk		
1965	63	Nitrochalk		
1966	126	AS & nitrochalk		
1967	126	AS & nitrochalk		
1968	251	Nitrochalk		
1969	0			
1970	126	Nitrochalk		
1971	126	Nitrochalk		
1972	130	Nitrochalk		
1973	130	Nitrochalk		
1974	250	Nitrochalk		
1975	80	Nitrochalk		
1976	170	Nitrochalk		
1977	95	Nitrochalk		
1978	130	Nitrochalk		
1979	0			
1980	0		Potassium kgK/ha	Magnesium kgMg/ha
1981	80	Nitrochalk	120	100
1982	80	Nitrochalk	120	40
1983	260	Nitrochalk	210	40
1984	0		0	0
1985	123	Compound	79	0
1986	190	Nitram	0	0
1987	0		0	0
1988	86	Nitram	80	17
1989	0		0	0
1990	0		0	0
1991	250	Compound & Nitram	32	26
1992	126	Compound & Nitram	32	0
1993	0		0	0
1994	0		0	0
1995	160	Nitram	0	0
1996	160	Nitram	0	0

Nitrogen (N) fertilizers:
AS = Ammonium sulphate
Nitrochalk = calcium ammonium nitrate
Nitram = ammonium nitrate
Compound = 25:0:16 compound fertilizer (% N:P:K)

Potassium (K) fertilizer
1981 onwards, as potassium chloride or compound (1985, 1991, 1992)

Magnesium (Mg) fertilizer:
1981 onwards, as magnesium sulphate or liquid chelated magnesium (1991)
Dolomitic limestone (magnesium calcium carbonate) was applied in some years at Woburn, as a source of magnesium (Paul Poulton, *pers. comm* .)

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