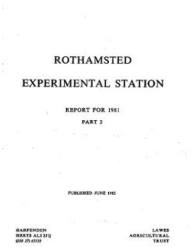
ROTHAMSTED RESEARCH

Rothamsted Experimental Station Report for 1981 Part 2



Full Table of Content

Use of Fertilisers in England and Wales, 1981

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Use of Fertilisers in England and Wales, 1981

B. M. CHURCH

The series of annual surveys done by staff of the ADAS Regional Soil Scientists in collaboration with representatives of the Fertiliser Manufacturers' Association and Rothamsted (Church & Lewis, 1977) was continued in 1981 when a random sample of 1350 farms in England and Wales was surveyed.

As in the last 2 years, there is no evidence of any major change in the use of P and K, but use of N per hectare crops and grass is estimated to have been about 8% more in 1981 than in 1980. This increase, which was evident on both tillage crops and grassland, was entirely in straight N fertilisers (Table 1).

TABLE 1

Fertiliser use on tillage crops and grassland (kg ha^{-1}), 1978–81

	Tillage crops				Grassland				All crops and grass			
	1978	1979	1980	1981	1978	1979	1980	1981	1978	1979	1980	1981
N Straight	53	66	77	92	67	71	69	74	60	69	73	83
Compound	51	46	44	43	45	45	50	51	47	45	47	47
Total	104	112	121	135	112	116	119	125	107	114	120	130
P_2O_5	51	49	49	51	26	25	27	25	37	36	37	38
K_2O	56	53	54	56	24	26	26	26	39	38	40	41

The most striking increases are again in the use of straight N on cereals. In 1981, winter wheat received an average total of 162 kg ha^{-1} N, comprising 144 kg ha^{-1} straight and 18 kg ha^{-1} in compound fertilisers. Nearly a fifth of the crop got more than 200 kg ha^{-1} N, and total applications of 250 kg ha^{-1} or more were reported (Table 2).

TABLE 2

Fertiliser use on winter wheat and spring barley (kg ha^{-1}), 1978–81

	Winter wheat				Spring barley			
	1978	1979	1980	1981	1978	1979	1980	1981
N Straight	106	117	126	144	21	26	24	37
Compound	19	18	19	18	62	62	63	61
Total	125	135	145	162	83	88	87	98
P_2O_5	44	46	46	49	38	37	37	37
K_2O	37	38	39	42	39	39	40	40

On spring barley, where increases in N use have been relatively modest in recent years, the total use of N, at 98 kg ha^{-1}, was up 12% and use of straight N was 50% more than in 1980. Extra top dressings, to compensate for loss of N from the seedbed due to the wet spring, certainly explain part of this large increase. However, it will be interesting to see whether a significant trend of increasing applications to spring cereals is becoming established. The average amounts of fertiliser nutrients used per hectare in 1981 on individual tillage crops, and on grassland classified according to utilisation, and the proportions of each crop which got different amounts of nutrient are summarised in Tables 3–8 at the end of this paper.

REFERENCE

CHURCH, B. M. & LEWIS, D. A. (1977) Fertiliser use on farm crops in England and Wales: Information from the Survey of Fertiliser Practice 1942–1976. *Outlook on Agriculture* **9**, 186–193.

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TABLE 3

Fertiliser use in England and Wales, 1981

	Fields	Hectares ('000)	Overall* (kg ha^{-1})			% Area receiving				Actual* (kg ha^{-1})		
			N	P_2O_5	K_2O	N	P	K	FYM	N	P_2O_5	K_2O
Spring wheat	69	29	133	31	31	100	77	77	21	133	40	40
Winter wheat	2065	1415	162	49	42	99	88	79	12	163	56	53
Spring barley	1915	1071	98	37	40	98	95	94	19	100	39	43
Winter barley	1263	755	143	50	47	99	92	88	12	144	54	54
Spring oats	126	39	72	37	36	95	95	91	24	76	39	39
Winter oats	155	55	107	49	46	99	90	87	14	109	54	52
Mixed corn	24	9	48	33	29	75	75	75	42	63	43	38
Maize	21	6	95	44	42	89	78	76	73	107	56	56
Early potatoes	56	20	198	203	229	100	100	100	40	198	203	229
Maincrop potatoes	337	109	194	192	259	98	98	98	42	199	197	266
Sugar beet	369	200	152	67	152	94	91	93	30	162	73	162
Swedes (stock)	78	18	60	115	75	88	96	90	35	68	120	84
Turnips (stock)	82	24	87	54	49	94	79	77	39	92	68	64
Kale and cow cabbage	118	29	110	44	51	96	85	85	43	115	52	59
Rape for stockfeed	37	10	94	72	43	89	77	77	28	105	94	56
Beans for stockfeed	70	31	3	30	24	16	50	48	7	19	61	49
Other stockfeed	72	18	69	71	66	77	86	82	35	90	83	81
Peas for human consumption	170	85	16	27	28	35	56	57	8	45	48	50
Runner and French beans	34	11	95	68	83	61	85	85	1	156	79	97
Brussels sprouts	40	9	235	98	215	98	98	98	10	240	100	219
Cabbages	37	8	231	66	143	93	72	86	25	248	92	166
Cauliflower	62	12	177	91	153	100	95	95	22	177	96	161
Onions	41	6	148	102	172	100	76	97	24	148	134	178
Small fruit	74	10	68	26	70	65	48	61	19	104	55	115
Top fruit	116	33	82	20	36	80	59	59	2	102	34	61
Oilseed rape	221	128	260	46	36	99	85	65	5	263	54	55
All tillage	8030	4251	135	51	56	95	89	84	17	142	57	66
1 year leys	20	5	90	8	11	86	36	36	21	104	22	29
2–7 year leys	2769	1662	172	32	39	91	67	69	41	190	47	56
Permanent grass	3046	2706	97	21	19	75	54	52	34	131	39	37
All crops and grass	13865	8624	130	38	41	88	74	71	27	149	51	58

* The average application of any fertiliser component over all fields including those receiving none is termed 'overall'. The average excluding fields with none of the component is termed 'actual'.

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TABLE 4

Percentages of crop area getting different amounts of N (kg ha^{-1})

	Fields	0	< 25	25–	50–	75–	100–	125–	150–	200–	250–	300–	400+
Spring wheat	69	0	0	2	5	18	15	19	39	1	0	0	0
Winter wheat	2065	1	0	1	2	6	9	18	46	16	2	0	0
Spring barley	1915	2	1	4	15	27	27	16	7	1	0	0	0
Winter barley	1263	1	1	1	3	7	16	27	35	8	1	0	0
Spring oats	126	5	0	6	34	43	9	1	1	1	0	0	0
Winter oats	155	1	4	4	9	21	20	26	9	4	0	0	0
Mixed corn	24	25	2	16	30	11	16	0	0	0	0	0	0
Maize	21	11	1	0	10	24	16	20	17	0	0	0	0
Early potatoes	56	0	0	0	1	0	0	5	51	26	9	8	0
Maincrop potatoes	337	2	0	0	1	4	6	6	34	33	8	5	1
Sugar beet	369	6	0	1	0	4	7	21	45	13	1	0	0
Swedes (stock)	78	12	10	23	21	16	9	5	3	1	0	0	0
Turnips (stock)	82	6	0	24	17	19	6	5	19	0	3	0	0
Kale and cow cabbage	118	4	1	5	8	16	24	25	15	1	1	0	0
Rape for stockfeed	37	11	0	10	17	22	14	3	11	12	0	0	0
Beans for stockfeed	70	84	8	7	0	0	0	0	0	0	0	0	0
Other stockfeed	72	23	9	8	10	21	12	4	11	1	0	1	0
Peas for human consumption	170	65	13	17	0	1	0	0	3	0	0	0	0
Runner and French beans	34	39	6	1	0	1	5	6	30	12	0	0	0
Brussels sprouts	40	2	0	2	1	0	16	2	14	21	17	12	14
Cabbages	37	7	0	1	0	8	6	6	15	6	30	17	4
Cauliflower	62	0	0	2	24	2	7	10	15	10	21	4	6
Onions	41	0	0	0	21	7	15	9	22	10	14	0	0
Small fruit	74	35	5	13	12	10	4	2	5	11	2	0	0
Top fruit	116	20	5	16	6	11	8	20	13	1	1	0	0
Oilseed rape	221	1	0	0	1	0	0	3	4	18	53	20	0
All tillage	8030	5	1	3	6	12	14	17	28	9	3	1	0
1 year leys	20	14	11	10	10	23	3	16	0	7	6	0	0
2–7 year leys	2769	9	0	5	11	10	5	7	13	11	9	12	6
Permanent grass	3046	25	1	10	15	12	5	7	9	5	4	4	2
All crops and grass	13865	12	1	6	10	12	10	12	19	8	5	4	2

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TABLE 5

Percentages of crop area getting different amounts of P_2O_5 (kg ha^{-1})

	Fields	0	<25	25–	50–	75–	100–	125–	150–	200–	250–	300–	400+
Spring wheat	69	23	3	48	24	2	0	0	0	0	0	0	0
Winter wheat	2065	12	2	28	44	12	1	1	0	0	0	0	0
Spring barley	1915	5	9	65	20	1	0	0	0	0	0	0	0
Winter barley	1263	8	5	28	45	13	1	0	0	0	0	0	0
Spring oats	126	5	9	64	16	5	1	0	0	0	0	0	0
Winter oats	155	10	4	25	53	8	0	0	0	0	0	0	0
Mixed corn	24	25	12	32	17	15	0	0	0	0	0	0	0
Maize	21	22	0	23	38	17	0	0	0	0	0	1	0
Early potatoes	56	0	0	0	1	0	5	13	27	40	5	10	0
Maincrop potatoes	337	2	0	0	0	9	5	7	30	31	9	5	1
Sugar beet	369	9	0	17	42	18	8	2	3	1	0	0	0
Swedes (stock)	78	4	6	10	16	20	7	4	11	14	8	0	0
Turnips (stock)	82	21	10	17	22	16	8	5	2	0	0	0	0
Kale and cow cabbage	118	15	5	34	35	9	2	0	1	0	0	0	0
Rape for stockfeed	37	23	9	20	18	7	3	0	3	13	0	3	0
Beans for stockfeed	70	50	3	17	17	8	0	1	3	0	0	0	0
Other stockfeed	72	14	7	19	26	9	6	4	11	2	0	1	0
Peas for human consumption	170	44	15	17	15	4	3	0	1	1	0	0	0
Runner and French beans	34	15	0	9	27	30	13	6	0	0	0	0	0
Brussels sprouts	40	2	0	4	21	20	25	18	10	0	0	0	0
Cabbages	37	28	0	12	16	20	13	2	8	0	0	0	0
Cauliflower	62	5	0	9	11	12	56	1	5	0	0	0	0
Onions	41	24	0	1	11	20	1	6	35	3	0	0	0
Small fruit	74	52	4	21	6	13	3	0	0	0	0	0	0
Top fruit	116	41	30	14	9	5	0	1	0	0	0	0	0
Oilseed rape	221	15	4	18	56	8	0	0	0	0	0	0	0
All tillage	8030	11	5	35	34	9	2	1	1	1	0	0	0
1 year leys	20	64	22	15	0	0	0	0	0	0	0	0	0
2–7 year leys	2769	33	13	31	14	5	2	1	1	1	0	0	0
Permanent grass	3046	46	18	25	7	1	1	0	1	1	0	0	0
All crops and grass	13865	26	10	31	22	6	1	1	1	1	0	0	0

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TABLE 6

Percentages of crop area getting different amounts of K_2O (kg ha^{-1})

	Fields	0	<25	25–	50–	75–	100–	125–	150–	200–	250–	300–	400+
Spring wheat	69	23	4	46	25	2	0	0	0	0	0	0	0
Winter wheat	2065	21	4	31	32	11	1	1	0	0	0	0	0
Spring barley	1915	6	7	56	28	3	1	0	0	0	0	0	0
Winter barley	1263	12	3	33	38	11	1	1	0	0	0	0	0
Spring oats	126	9	6	64	19	3	1	0	0	0	0	0	0
Winter oats	155	13	4	31	35	16	0	0	0	0	0	0	0
Mixed corn	24	25	15	37	18	6	0	0	0	0	0	0	0
Maize	21	24	0	23	36	17	0	0	0	0	0	0	0
Early potatoes	56	0	0	0	0	0	4	0	37	25	12	18	4
Maincrop potatoes	337	2	0	2	0	1	1	5	12	14	33	27	4
Sugar beet	369	7	1	1	3	13	19	6	22	17	8	4	0
Swedes (stock)	78	10	6	13	24	17	15	4	11	0	0	0	0
Turnips (stock)	82	23	9	18	26	13	3	8	0	0	0	0	0
Kale and cow cabbage	118	15	4	29	35	10	5	1	2	0	0	0	0
Rape for stockfeed	37	23	2	33	31	8	0	0	2	2	0	0	0
Beans for stockfeed	70	52	4	19	17	8	0	0	0	0	0	0	0
Other stockfeed	72	18	5	20	22	6	12	4	11	1	0	0	0
Peas for human consumption	170	43	15	14	17	7	4	0	0	0	0	0	0
Runner and French beans	34	15	0	12	28	28	5	0	0	0	12	0	0
Brussels sprouts	40	2	0	0	0	2	4	15	28	8	17	24	0
Cabbages	37	14	0	1	7	17	16	1	20	4	15	0	5
Cauliflower	62	5	0	2	13	6	15	16	16	16	4	2	5
Onions	41	3	0	3	4	7	6	1	45	16	15	0	0
Small fruit	74	39	0	2	5	15	15	10	12	3	0	0	0
Top fruit	116	41	2	32	4	9	5	4	3	0	0	0	0
Oilseed rape	221	35	4	14	41	6	0	0	0	0	0	0	0
All tillage	8030	16	4	34	28	8	2	1	2	2	1	1	0
1 year leys	20	64	15	15	6	0	0	0	0	0	0	0	0
2–7 year leys	2769	31	9	27	15	8	5	3	2	0	0	0	0
Permanent grass	3046	48	14	25	9	3	1	0	0	0	0	0	0
All crops and grass	13865	29	8	30	19	7	2	1	1	1	1	1	0

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TABLE 7

Fertiliser use on grassland classified by utilisation

	Fields	% Grassland area	Overall* (kg ha^{-1}) N	P_2O_5	K_2O	% Area receiving N	P	K	FYM	Actual* (kg ha^{-1}) N	P_2O_5	K_2O
Paddock grazed	130	2	236	21	24	96	56	54	26	247	37	45
Paddock grazed and mown	39	1	201	41	44	91	64	65	55	221	65	68
Strip grazed	130	2	217	24	28	98	69	69	46	221	35	41
Strip grazed and mown	121	2	204	33	48	94	58	65	63	218	57	74
Set stocked	638	11	191	26	22	83	57	53	26	230	45	41
Set stocked and mown	312	5	177	34	48	95	73	77	50	187	47	62
Cut for seed	28	0	122	28	24	79	55	62	1	154	51	40
Cut for silage	985	15	201	38	56	98	79	83	63	205	48	68
Cut for hay	117	1	71	13	13	73	34	34	29	96	38	37
Cut for hay and grazed†	1065	16	84	25	25	86	67	68	51	98	37	38
Other grazings	2131	41	73	20	15	67	48	46	23	110	41	32
Not stated/not used	165	3	69	24	14	72	48	47	12	96	50	29
All grass	5872		123	25	26	80	59	58	37	153	43	45

* The average application of any fertiliser component over all fields including those receiving none is termed 'overall'. The average excluding fields with none of the component is termed 'actual'.

† Excluding fields intensively grazed as in the first 6 categories above.

TABLE 8

Percentages of grassland area by utilisation getting different amounts of N (kg ha^{-1})

	Fields	0	<25	25–	50–	75–	100–	125–	150–	200–	250–	300–	400+
Paddock grazed	130	4	0	0	11	7	3	14	7	3	12	22	16
Paddock grazed and mown	39	9	0	19	0	14	2	3	8	9	6	15	15
Strip grazed	130	2	0	2	4	10	4	13	19	11	7	15	13
Strip grazed and mown	121	6	0	1	3	7	9	9	13	18	14	20	1
Set stocked	638	17	0	6	12	6	3	5	9	5	7	15	14
Set stocked and mown	312	5	0	10	6	11	4	4	14	20	11	11	4
Cut for seed	28	21	0	11	13	2	0	4	25	14	7	3	0
Cut for silage	985	2	0	1	6	8	6	10	19	16	12	15	4
Cut for hay	117	27	0	2	16	26	10	12	6	1	0	0	0
Cut for hay and grazed†	1065	14	1	13	23	20	6	8	8	6	1	1	0
Other grazings	2131	33	1	11	16	12	5	6	8	3	4	2	0
Not stated/not used	165	28	1	24	12	10	4	8	3	8	0	2	1
All grass	5872	20	1	9	14	12	5	7	10	7	6	7	3

† Excluding fields intensively grazed as in the first 6 categories above.