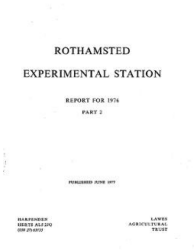
ROTHAMSTED RESEARCH

Rothamsted Experimental Station Report for 1976, Part 2



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Use of Fertilisers in England and Wales, 1976

B. M. Church

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Use of Fertilisers in England and Wales, 1976

B. M. CHURCH

Continuing the series of annual surveys done by ADAS Soil Scientists and representatives of the Fertiliser Manufacturers Association in collaboration with the Statistics Department, Rothamsted (Church & Webber, 1971) a representative sample of 1380 farms was surveyed in England and Wales in 1976.

Efficiency of field work was increased in 1976 by excluding farms with less than 20 ha (50 acres) crops and grass and 'agriculturally insignificant holdings' with total inputs less than 275 standard man-days. Estimates of use per hectare given in reports for previous years must therefore be adjusted to be strictly comparable with those for 1976.

Estimated N use on grassland was slightly less in 1976 than in 1975, but more N was used per hectare on tillage crops, partly because the area under winter wheat recovered from the depressed levels of the previous year. The decline in use of P and K over the last three years was also checked (Table 1).

As preliminary estimates of fertiliser use were required by October, a random subsample of 800 farms was surveyed in June–July and the rest in August–September. Estimates of fertiliser use are for the 'crop year' October–September, so fertiliser use in the late summer had to be forecast for farms in the first half of the sample.

Due to the exceptionally low summer rainfall these forecasts, particularly for N on grassland, overestimated actual use as determined from the second half of the sample. However, the unadjusted estimates from the first half of the sample are themselves of interest because they suggest that N use on grassland would have been maintained, or possibly continued to increase in 1976 had this been a normal year (Table 2).

TABLE 1

Fertiliser use on tillage, leys and permanent grass, 1973–76 (kg ha^{-1})

	Tillage			Leys			P.G.			All crops & grass		
	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
1973	89	54	60	129	44	32	63	26	16	87	43	39
1974	85	51	56	136	36	30	71	23	16	92	40	38
1975	87	46	51	142	34	28	77	20	16	96	35	34
1976*	96	50	56	141	35	32	71	22	14	97	38	37

* Estimates for previous years adjusted to be comparable with those for 1976.

TABLE 2

Estimated use of N in 1975 and 1976 (kg ha^{-1})

		Tillage	Leys	P.G.	All crops & grass
1975		87	142	77	96
1976	Preliminary sample (including forecasts)	96	150	77	101
	Final estimate	96	141	71	97

Estimates of average fertiliser use in 1976 and of the proportions of crop area getting different amounts of nutrients are given for major crops in Tables 3–6 on the following pages. Further details, in particular for grassland and for fruit and horticultural crops, will be reported elsewhere.

REFERENCE

CHURCH, B. M. & WEBBER, J. (1971) Fertiliser practice in England and Wales: a new series of surveys. *Journal of the Science of Food and Agriculture* **22**, 1–7.

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TABLE 3

Fertiliser use in England and Wales, 1976

	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	109	28	85	42	35	100	88	79	12	86	48	44
Winter wheat	2184	1102	102	42	33	96	81	70	12	106	52	47
Spring barley	2745	1476	78	38	38	98	96	93	18	79	40	41
Winter barley	538	271	97	43	38	99	89	81	12	98	48	46
Spring oats	225	69	60	36	33	89	88	86	18	67	41	38
Winter oats	258	100	75	42	37	94	87	83	19	80	48	45
Mixed corn	43	16	49	43	36	90	93	90	22	54	46	40
Maize	76	31	117	60	63	98	94	90	52	119	64	69
Early potatoes	88	29	172	165	206	100	100	100	40	172	165	206
Maincrop potatoes	431	138	177	175	250	99	98	98	37	179	178	254
Sugar beet	441	208	155	81	173	100	97	97	30	156	83	178
Swedes and turnips (stock)	210	55	64	86	66	88	91	86	39	72	95	77
Mangolds	51	5	132	89	123	97	97	97	61	137	92	127
Kale and cow cabbage	224	55	107	53	57	92	87	87	36	117	61	65
Rape (stock)	78	34	134	85	46	97	92	75	9	138	93	61
Beans (stock)	98	32	3	25	13	13	39	26	10	24	66	49
Mixed roots and green crops	57	16	86	89	77	93	91	88	39	92	98	88
Peas—vining	80	36	4	15	17	14	29	28	6	31	51	60
Peas—harvested dry	59	25	5	39	31	15	62	54	7	31	64	58
Broad beans	22	8	20	85	103	33	92	74	1	61	92	139
Runner beans	25	5	98	55	80	62	56	62	8	159	98	129
French beans	20	6	114	71	81	78	77	78	26	147	91	104
Brussels sprouts	76	18	261	101	168	98	92	93	6	266	109	181
Cabbages	134	18	180	85	151	99	88	87	28	182	96	173
Cauliflower	56	10	174	93	162	92	70	74	25	190	132	218
Carrots	38	9	64	53	84	77	77	77	12	82	68	109
Onions	65	9	119	112	157	100	95	95	3	120	118	164
Lettuce	46	7	163	75	160	100	96	94	27	164	78	171
Oilseed rape	65	26	240	60	56	100	98	70	7	240	61	79
Arable silage	67	23	83	42	38	91	85	82	37	91	49	46
All tillage	9367	4076	96	50	56	94	88	82	18	102	57	68
One year leys	117	45	137	29	24	95	53	48	27	145	54	50
Two to seven year leys	3366	1842	141	35	32	91	65	64	42	156	54	50
Permanent grass	4015	2908	71	22	14	66	45	41	31	107	49	35
All crops and grass	16899	8885	97	38	37	84	69	65	27	116	55	58

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

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	109	0	2	9	22	25	28	11	2	0	0	0	0
Winter wheat	2184	4	2	4	8	22	32	19	9	0	0	0	0
Spring barley	2745	2	1	9	26	41	16	4	1	0	0	0	0
Winter barley	538	1	2	3	10	35	33	11	5	0	0	0	0
Spring oats	225	11	3	16	30	30	6	3	1	0	0	0	0
Winter oats	258	6	6	14	20	26	22	3	2	0	0	0	0
Mixed corn	43	10	3	34	41	4	8	0	0	0	0	0	0
Maize	76	2	0	2	3	17	27	41	9	0	1	0	0
Early potatoes	88	0	0	2	0	5	4	18	57	7	5	3	0
Maincrop potatoes	431	1	2	1	1	1	4	8	58	20	4	1	0
Sugar beet	441	0	0	1	0	4	10	29	43	9	2	2	0
Swedes and turnips (stock)	210	12	3	25	26	15	8	6	4	1	0	0	0
Mangolds	51	3	2	2	6	22	12	23	19	2	4	7	0
Kale and cow cabbage	224	8	0	3	19	13	13	22	17	4	0	1	0
Rape (stock)	78	3	2	13	19	14	4	2	9	14	20	0	0
Beans (stock)	98	87	9	2	2	0	0	0	0	0	0	0	0
Mixed roots and green crops	57	7	0	19	22	9	19	11	10	4	0	0	0
Peas—vining	80	86	1	12	0	0	0	0	0	0	0	0	0
Peas—harvested dry	59	85	7	7	0	0	0	0	0	0	0	1	0
Broad beans	22	67	0	17	12	2	0	0	0	1	0	0	0
Runner beans	25	38	0	0	2	9	0	20	10	20	1	0	0
French beans	20	22	0	0	1	30	5	0	27	15	0	0	0
Brussels sprouts	76	2	0	1	0	6	12	3	16	11	19	28	0
Cabbages	134	1	0	2	4	6	9	8	31	27	5	7	0
Cauliflower	56	8	0	0	8	6	11	10	22	17	6	12	0
Carrots	38	23	0	11	15	37	9	0	4	0	0	0	0
Onions	65	0	0	7	6	35	20	10	11	7	3	2	0
Lettuce	46	0	0	10	5	11	3	4	25	38	0	5	0
Oilseed rape	65	0	0	0	1	0	0	6	12	32	38	9	1
Arable silage	67	9	0	18	16	27	11	13	3	0	0	3	0
All tillage	9367	6	1	7	15	26	20	11	9	2	1	1	0
One year leys	117	5	0	2	12	20	11	15	13	12	3	5	2
Two to seven year leys	3366	9	1	6	15	14	7	10	11	7	7	7	3
Permanent grass	4015	34	1	10	18	12	5	6	6	3	2	2	1
All crops and grass	16899	16	1	8	16	19	12	9	9	4	3	2	1

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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	109	12	6	59	14	6	0	0	1	2	0	0	0
Winter wheat	2184	19	2	35	37	5	1	0	1	1	0	0	0
Spring barley	2745	4	7	72	14	1	0	0	0	0	0	0	0
Winter barley	538	11	6	45	31	5	0	1	1	0	0	0	0
Spring oats	225	12	10	58	15	4	0	0	1	1	0	0	0
Winter oats	258	13	6	35	42	3	1	0	1	0	0	0	0
Mixed corn	43	7	5	72	4	8	3	0	0	2	0	0	0
Maize	76	6	0	30	41	18	0	2	3	0	0	0	0
Early potatoes	88	0	0	0	3	5	3	16	64	6	1	1	0
Maincrop potatoes	431	2	2	1	1	3	5	9	54	18	2	4	0
Sugar beet	441	3	1	10	31	27	16	5	7	0	0	0	0
Swedes and turnips (stock)	210	9	3	22	14	13	13	7	13	4	0	0	0
Mangolds	51	3	1	14	35	15	10	4	13	5	0	0	0
Kale and cow cabbage	224	13	2	26	35	17	4	2	2	0	0	0	0
Rape (stock)	78	8	2	29	30	5	0	6	9	4	6	1	0
Beans (stock)	98	61	1	9	20	4	1	0	4	0	0	0	0
Mixed roots and green crops	57	9	0	7	22	25	14	8	13	3	0	0	0
Peas—vining	80	71	0	18	10	0	0	0	1	0	0	0	0
Peas—harvested dry	59	38	3	20	24	8	0	0	6	1	0	0	0
Broad beans	22	8	0	1	47	20	5	19	0	0	0	0	0
Runner beans	25	44	0	2	6	29	0	19	0	0	0	0	0
French beans	20	23	0	0	5	48	24	1	0	0	0	0	0
Brussels sprouts	76	8	0	11	14	29	5	10	21	0	2	0	0
Cabbages	134	12	1	9	31	9	11	15	11	0	0	0	0
Cauliflower	56	30	0	0	17	4	12	15	8	15	0	0	0
Carrots	38	23	0	39	11	12	9	3	3	0	0	0	0
Onions	65	5	0	9	16	30	7	3	25	4	0	0	1
Lettuce	46	4	0	12	39	22	18	1	4	0	0	0	0
Oilseed rape	65	2	0	14	72	8	3	0	0	1	0	0	0
Arable silage	67	15	12	41	25	2	3	1	0	1	0	0	0
All tillage	9367	12	4	44	24	6	2	1	4	1	0	0	0
One year leys	117	47	4	27	11	7	1	1	2	0	0	0	0
Two to seven year leys	3366	34	11	32	11	3	2	2	3	2	0	0	0
Permanent grass	4015	55	11	23	4	1	1	1	3	1	0	0	0
All crops and grass	16899	31	8	35	15	4	2	1	3	1	0	0	0

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	109	21	2	51	19	6	0	0	0	0	0	0	0
Winter wheat	2184	30	2	36	27	5	0	0	0	0	0	0	0
Spring barley	2745	7	5	65	18	3	0	0	0	0	0	0	0
Winter barley	538	19	3	45	27	5	1	1	0	0	0	0	0
Spring oats	225	14	7	60	17	3	0	0	0	0	0	0	0
Winter oats	258	17	6	40	34	2	1	0	0	0	0	0	0
Mixed corn	43	10	5	65	18	0	3	0	0	0	0	0	0
Maize	76	10	0	24	35	22	0	7	3	0	0	0	0
Early potatoes	88	0	0	2	0	0	2	10	41	13	22	8	1
Maincrop potatoes	431	2	1	1	0	1	1	1	9	24	36	20	3
Sugar beet	441	3	0	1	8	8	11	6	23	27	7	5	2
Swedes and turnips (stock)	210	13	3	26	19	16	11	3	6	2	0	0	0
Mangolds	51	3	1	4	30	10	10	8	15	10	8	1	0
Kale and cow cabbage	224	13	1	27	30	17	5	4	1	1	0	0	0
Rape (stock)	78	25	5	39	21	5	0	0	0	0	6	0	0
Beans (stock)	98	74	0	10	15	0	0	0	0	0	0	0	0
Mixed roots and green crops	57	12	5	10	27	15	9	7	12	3	0	0	0
Peas—vining	80	72	0	9	17	0	2	0	0	0	0	0	0
Peas—harvested dry	59	46	3	12	25	9	4	0	0	0	0	1	0
Broad beans	22	26	0	1	2	0	8	54	10	0	0	0	0
Runner beans	25	38	0	0	5	30	0	4	21	3	0	0	0
French beans	20	22	0	0	17	6	24	30	0	1	0	0	0
Brussels sprouts	76	7	0	1	1	8	17	9	30	13	6	5	2
Cabbages	134	10	1	2	7	8	9	16	30	6	4	1	6
Cauliflower	56	26	0	0	0	0	4	1	39	13	7	11	0
Carrots	38	23	0	4	21	11	16	9	12	1	3	0	0
Onions	65	5	0	4	2	12	16	14	21	19	2	5	2
Lettuce	46	1	0	1	16	8	2	1	40	30	0	0	2
Oilseed rape	65	30	0	12	46	6	0	0	0	0	6	0	0
Arable silage	67	18	18	33	24	3	2	2	0	0	0	0	0
All tillage	9367	18	3	42	20	5	2	1	3	3	2	1	0
One year leys	117	52	6	19	16	2	3	0	1	0	0	0	0
Two to seven year leys	3366	36	9	30	12	6	4	2	1	1	0	0	0
Permanent grass	4015	59	9	24	5	2	0	0	0	0	0	0	0
All crops and grass	16899	35	7	33	14	4	2	1	1	1	1	1	0

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