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Use of Fertilisers in England and Wales, 1977

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Use of Fertilisers in England and Wales, 1977

B. M. CHURCH

In this continuing 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, Church & Lewis, 1978) a representative sample of 1335 farms was surveyed in England and Wales in 1977.

The main feature of the 1977 results is a marked increase in the use of N on both leys and permanent grass. Use of P and K has changed little.

For nearly 10 years, N use on grassland has been increasing at an average rate of about $7\frac{1}{2}\%$ per year. This increase was checked by the drought in the summer of 1976, but the upward trend was fully resumed in 1977 when N use on grassland was about 15% more than in 1975 (Table 1).

After little change for several years, there was evidence in both 1976 and 1977 of an overall increase in N use per hectare on tillage crops. Although there may have been changes on other individual crops, the most notable increase is on winter wheat where, possibly due to the introduction of new varieties, N use is estimated to have increased by nearly a quarter in the last 2 years to an average of 115 kg ha^{-1} (Table 2). As a general average for winter wheat, this would seem to be adequate compared with current recommendations. However, about a tenth of the total N used on this crop is still applied in autumn when it may be of little benefit.

TABLE 1
Fertiliser use on tillage, leys and permanent grass, 1974-77 (kg ha^{-1})

	Tillage			Leys			P.G.†			All crops & grass		
	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
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	144	36	33	74	22	14	99	39	37
1977*	100	49	56	166	33	32	88	21	16	111	37	39

† Includes grass seeded more than 7 years ago.

* Estimates for previous years adjusted to be comparable with those for 1977.

TABLE 2
Fertiliser use on winter wheat (kg ha^{-1}) 1975-77

N			P ₂ O ₅			K ₂ O		
1975	1976	1977	1975	1976	1977	1975	1976	1977
93	102	115	39	42	40	33	33	33

Estimates of average fertiliser use in 1977 and of the proportions of crop area getting different amounts of nutrients are given for major crops in Tables 3-6. Table 7 gives similar information for grassland classified according to the number of years since seeding, so that use can be related to the revised categories in the Agricultural Census. More detailed information for grassland and for horticultural crops will be reported elsewhere.

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- 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.
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, 1977

Fields	Hectares (⁰⁰⁰)	Overall* (kg ha ⁻¹)				% Area receiving				Actual* (kg ha ⁻¹)		
		N	P ₂ O ₅	K ₂ O		N	P	K	FYM	N	P ₂ O ₅	K ₂ O
Spring wheat	131	86	30	28		92	77	76	9	94	39	38
Winter wheat	1947	53	33	33		98	77	69	11	116	52	48
Spring barley	3071	935	40	37		98	94	91	17	83	39	41
Winter barley	610	1458	36	41		100	91	85	9	104	49	48
Spring oats	212	258	34	32		96	92	88	23	70	37	36
Winter oats	217	58	47	42		98	88	83	11	88	53	51
Mixed corn	37	64	37	33		93	90	86	37	54	41	38
Rye	41	13	27	31		96	66	66	20	85	41	46
Maize	40	10	59	57		99	93	87	50	116	64	66
Early potatoes	116	170	178	216		97	97	97	50	176	184	223
Maincrop potatoes	408	181	186	250		100	100	100	51	181	186	251
Sugar beet	484	222	71	157		97	96	99	33	145	73	159
Swedes (stock)	121	60	127	85		87	96	92	48	69	132	92
Turnips (stock)	81	17	66	53		90	83	84	42	69	80	63
Mangolds	51	5	96	134		98	98	98	62	121	97	136
Kale and cow cabbage	270	51	49	53		95	82	81	43	116	60	65
Rape (stock)	62	16	112	41		95	94	87	17	88	119	46
Beans (stock)	97	33	8	19		17	42	34	10	45	79	57
Mixed roots and green crops	57	16	69	78		92	91	91	68	89	76	85
Peas—vining	87	43	21	26		20	47	49	4	35	46	54
Peas—harvested dry	88	36	24	25		24	52	49	1	24	46	52
French beans	24	4	84	73		95	90	90	0	160	94	81
Brussels sprouts	27	6	111	164		100	100	100	2	259	111	164
Cabbage	68	13	68	125		99	96	96	7	145	71	130
Cauliflower	60	9	84	162		100	89	89	18	148	95	183
Carrots	34	61	62	77		77	74	74	4	78	84	104
Onions	39	150	129	188		100	100	100	15	150	129	188
Oilseed rape	108	8	53	39		100	86	58	3	238	61	68
Cereals for grazing	27	83	19	19		96	49	49	27	86	39	39
Forage maize	59	17	58	62		99	95	92	67	105	61	67
Arable silage	64	19	38	48		97	90	90	39	81	42	53
Lucerne	25	7	84	163		20	77	85	22	66	110	191
All tillage	9298	100	49	56		95	86	82	18	106	56	68
One year leys	74	22	33	37		94	61	62	27	143	53	59
Two to seven year leys	3557	1642	33	32		95	67	66	38	175	49	34
Permanent grass	3502	88	21	16		74	50	47	29	119	42	34
All crops and grass	16431	111	37	39		89	72	69	26	125	52	57

* 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	131	8	1	2	22	27	24	12	3	0	1	0	0
Winter wheat	1947	2	0	3	8	19	24	28	15	1	0	0	0
Spring barley	3071	2	1	7	24	43	17	5	2	0	0	0	0
Winter barley	610	0	1	2	8	30	36	17	5	0	0	0	0
Spring oats	212	4	1	11	41	32	7	1	2	0	0	0	0
Winter oats	217	2	2	8	24	27	24	11	2	0	0	0	0
Mixed corn	37	7	11	24	37	15	1	3	3	0	0	0	0
Rye	41	4	11	6	8	49	11	6	5	0	0	0	0
Maize	40	1	3	0	2	15	33	33	13	0	0	0	0
Early potatoes	116	3	3	0	1	1	3	15	49	17	6	1	0
Maincrop potatoes	408	0	1	1	1	2	5	8	54	19	6	3	0
Sugar beet	484	3	0	1	1	8	12	38	29	5	2	1	0
Swedes (stock)	121	13	6	22	21	20	10	2	6	0	0	0	0
Turnips (stock)	81	10	6	21	24	21	4	10	2	1	0	0	0
Mangolds	51	2	0	8	13	16	15	16	23	4	2	1	1
Kale and cow cabbage	270	5	1	6	10	19	18	22	14	5	1	0	0
Rape (stock)	62	5	0	7	13	39	25	4	7	0	0	0	0
Beans (stock)	97	83	14	0	0	0	0	0	1	1	0	0	0
Mixed roots and green crops	57	8	3	12	25	18	8	12	8	5	0	0	0
Peas—vining	87	80	4	10	5	1	0	0	0	0	0	0	0
Peas—harvested dry	88	76	18	2	4	0	0	0	0	0	0	0	0
French beans	24	5	0	0	0	0	17	9	40	24	5	0	0
Brussels sprouts	27	0	0	3	0	8	0	0	4	10	42	33	0
Cabbage	68	1	9	5	5	17	8	10	13	15	14	2	1
Cauliflower	60	0	1	2	28	11	6	5	20	15	1	10	1
Carrots	34	23	5	4	19	30	13	5	2	0	0	0	0
Onions	39	0	0	0	0	19	26	10	30	2	7	6	0
Oilseed rape	108	0	0	0	1	4	0	1	11	40	34	7	2
Cereals for grazing	27	4	1	15	18	39	2	18	4	0	0	0	0
Forage maize	59	1	0	0	10	25	31	28	4	1	0	0	0
Arable silage	64	3	2	9	38	23	11	6	5	3	0	0	0
Lucerne	25	80	3	6	9	0	0	0	0	0	0	2	0
All tillage	9298	5	1	5	15	27	18	14	10	3	1	0	0
One year leys	74	6	0	2	20	15	8	12	18	4	9	6	0
Two to seven year leys	3557	5	1	5	14	13	5	10	13	10	9	9	5
Permanent grass	3502	26	2	9	17	15	5	8	7	4	3	3	1
All crops and grass	16431	11	1	6	15	20	11	12	10	5	3	3	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	131	23	6	57	12	1	0	1	0	0	0	0	0
Winter wheat	1947	23	3	39	29	4	1	0	1	0	0	0	0
Spring barley	3071	6	8	72	12	1	0	0	0	0	0	0	0
Winter barley	610	9	3	50	32	4	1	1	0	0	0	0	0
Spring oats	212	8	10	73	7	1	1	0	1	1	0	0	0
Winter oats	217	12	4	41	31	6	3	2	1	0	0	0	0
Mixed corn	37	10	27	39	9	10	0	4	1	0	0	0	0
Rye	41	34	20	22	23	0	1	0	0	0	0	0	0
Maize	40	7	0	20	46	14	10	3	0	0	0	0	0
Early potatoes	116	3	3	0	1	4	6	12	38	17	10	5	0
Maincrop potatoes	408	0	2	0	1	3	3	7	51	22	5	5	0
Sugar beet	484	4	2	16	39	24	8	2	4	1	0	0	0
Swedes (stock)	121	4	1	5	13	19	17	15	9	12	3	0	2
Turnips (stock)	81	17	3	30	19	6	7	5	3	8	1	0	0
Mangolds	51	2	6	14	12	22	16	14	12	1	0	1	0
Kale and cow cabbage	270	18	3	31	28	12	3	3	0	0	0	0	0
Rape (stock)	62	6	0	27	29	1	1	7	6	13	4	6	0
Beans (stock)	97	58	0	14	18	2	2	0	0	0	5	0	0
Mixed roots and green crops	57	9	9	19	27	16	6	5	4	3	2	0	0
Peas—vining	87	53	3	22	17	5	0	0	0	0	0	0	0
Peas—harvested dry	88	48	5	25	20	0	0	2	0	0	0	0	0
French beans	24	10	0	18	9	17	26	2	18	1	0	0	0
Brussels sprouts	27	0	1	14	5	37	3	15	21	0	4	0	0
Cabbage	68	4	17	7	20	36	12	0	4	0	0	0	0
Cauliflower	60	11	1	9	9	26	27	7	7	0	1	0	0
Carrots	34	26	0	12	13	30	3	12	3	0	0	0	0
Onions	39	0	6	1	11	8	16	2	46	11	0	0	0
Oilseed rape	108	14	0	16	55	7	2	5	0	0	0	0	0
Cereals for grazing	27	51	18	20	8	0	4	0	0	0	0	0	0
Forage maize	59	5	5	20	58	6	3	0	3	0	0	0	0
Arable silage	64	10	27	29	21	12	0	0	0	0	0	0	0
Lucerne	25	23	6	3	8	9	35	6	10	0	0	0	0
All tillage	9298	14	6	47	21	5	2	1	3	1	0	0	0
One year leys	74	39	5	29	13	10	1	1	2	0	0	0	0
Two to seven year leys	3557	33	13	34	10	4	2	2	2	1	0	0	0
Permanent grass	3502	50	15	25	4	1	1	1	2	1	0	0	0
All crops and grass	16431	28	10	38	13	4	1	1	3	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	131	24	6	59	10	2	0	0	0	0	0	0	0
Winter wheat	1947	31	3	40	20	4	1	0	1	0	0	0	0
Spring barley	3071	9	6	66	17	1	0	0	0	0	0	0	0
Winter barley	610	15	1	54	25	3	1	1	1	0	0	0	0
Spring oats	212	12	8	68	10	1	1	0	0	0	0	0	0
Winter oats	217	17	3	38	32	8	2	0	0	0	0	0	0
Mixed corn	37	14	23	38	12	13	0	0	0	0	0	0	0
Rye	41	34	8	38	16	3	1	0	0	0	0	0	0
Maize	40	13	0	16	46	10	12	3	0	0	0	0	0
Early potatoes	116	3	3	0	0	1	4	9	21	17	26	13	2
Maincrop potatoes	408	0	1	1	0	1	4	4	8	25	29	23	4
Sugar beet	484	1	0	0	10	12	14	7	25	20	8	2	0
Swedes (stock)	121	8	2	10	18	24	24	6	7	0	0	0	0
Turnips (stock)	81	16	7	28	25	9	7	0	0	1	0	0	0
Mangolds	51	2	1	4	12	14	10	18	20	16	5	0	0
Kale and cow cabbage	270	19	2	28	28	12	4	3	0	0	0	0	0
Rape (stock)	62	13	2	43	37	5	0	0	0	0	0	0	0
Beans (stock)	97	66	0	14	14	3	3	0	0	0	0	0	0
Mixed roots and green crops	57	9	6	17	20	21	11	5	8	3	2	0	0
Peas—vining	87	51	1	19	22	5	0	0	2	0	0	0	0
Peas—harvested dry	88	51	1	21	20	3	2	0	0	0	0	0	0
French beans	24	10	0	3	45	17	24	0	1	0	0	0	0
Brussels sprouts	27	0	0	0	28	3	4	2	25	24	0	11	0
Cabbage	68	4	9	2	14	11	14	4	22	13	4	1	0
Cauliflower	60	11	0	5	8	3	5	1	35	11	18	2	1
Carrots	34	26	0	5	15	21	5	17	7	5	0	0	0
Onions	39	0	0	5	3	6	9	13	15	4	42	4	0
Oilseed rape	108	42	0	10	34	7	2	5	0	0	0	0	0
Cereals for grazing	27	51	18	24	2	0	6	0	0	0	0	0	0
Forage maize	59	8	3	20	52	9	2	0	2	2	2	0	0
Arable silage	64	10	6	26	41	15	0	2	0	0	0	0	0
Lucerne	25	15	6	3	3	10	6	1	14	35	0	2	7
All tillage	9298	18	4	45	18	4	2	1	3	3	2	1	0
One year leys	74	38	3	23	18	12	5	0	2	0	0	0	0
Two to seven year leys	3557	34	11	31	12	6	3	2	1	0	0	0	0
Permanent grass	3502	53	14	26	6	1	1	0	0	0	0	0	0
All crops and grass	16431	31	8	36	13	4	2	1	2	1	1	1	0

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TABLE 7
Fertiliser use on grassland by years since seeded

	Fertiliser use on grassland by years since seeded		Overall* (kg ha ⁻¹)			% Area receiving				Actual* (kg ha ⁻¹)		
		Hectares ('000)	N	P ₂ O ₅	K ₂ O	N	P	K	FYM	N	P ₂ O ₅	K ₂ O
1 year leys	74	23	136	32	36	94	59	60	28	144	54	61
Other grassland												
First year	849	295	160	44	39	94	73	71	28	171	60	55
Second year	770	305	180	33	35	96	68	68	30	188	49	52
One or two years	1619	600	170	38	37	95	70	70	29	180	55	53
Third year	617	318	162	27	31	94	62	64	47	172	44	48
Fourth year	437	232	169	27	29	95	65	64	45	178	42	44
Fifth year	351	218	171	34	33	96	70	69	39	177	49	48
Three to five years	1405	769	167	29	31	95	65	66	44	175	45	47
One to five years	3103	1412	168	33	33	95	67	67	37	177	49	49
Six to seven years	405	236	143	29	23	93	65	57	51	153	45	40
Over five years	3942	2640	91	21	17	73	50	47	32	124	42	35
One to seven years	3508	1648	164	32	32	95	67	66	39	173	48	48
Over seven years	3537	2404	85	20	16	71	48	46	30	120	41	35
All grassland	7119	4075	118	25	22	81	56	54	33	145	45	42

* 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'.