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Use of Fertilizers in England and Wales, 1985

J. I. Elsmere

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Use of fertilizers in England and Wales, 1985

J. I. ELSMERE

This series of annual surveys continued in 1985 as a collaborative project between ADAS soil scientists, representatives of the Fertiliser Manufacturers' Association and Rothamsted. Due to reduced resources, ADAS withdrew from the fieldwork this year, but the size of the survey was almost maintained at previous levels. A sample of 1187 farms was surveyed by Farm Research Limited on behalf of the Fertiliser Manufacturers' Association during June and July. A similar survey was again done in Scotland on a sample of 264 farms, and the results of this will be reported elsewhere.

Compared with 1984, the survey estimates for England and Wales show little change in total use of N, P and K per hectare crops and grass (Table 1). However there continues to be some increase in N use per hectare on tillage crops. Following the trend of recent years, use of N in compound fertilizers decreased, while that of straight N increased. This is particularly noticeable on winter wheat (Table 2) where use of compound N decreased sharply from 16 to 11 kg ha⁻¹; this was more than compensated for by an increase in use of straight N from 171 to 181 kg ha⁻¹. The proportion of winter wheat which got any N in compounds decreased from 67% in 1984 to 57% in 1985. Apart from the trend towards straight N, this change resulted from use of relatively more PK and relatively less low-N compound fertilizers. Unlike recent years, the percentage of winter-sown cereals remained about the same as for 1984 at about 84%. After estimated increases in 1984, use of P and K per hectare on tillage crops was about the same as in 1983.

TABLE 1

Fertilizer use on tillage crops and grassland (kg ha⁻¹), 1982-85

	Tillage crops				Grassland				All crops and grass			
	1982	1983	1984	1985	1982	1983	1984	1985	1982	1983	1984	1985
N Straight	99	116	128	134	71	69	71	70	85	91	99	102
Compound	42	37	34	27	52	57	61	61	47	48	48	44
Total	141	154	162	161	123	126	132	131	132	139	147	146
P ₂ O ₅	55	54	61	56	24	26	25	24	39	39	42	40
K ₂ O	61	60	68	63	28	28	33	32	44	44	50	48

TABLE 2

Fertilizer use on winter wheat and spring barley (kg ha⁻¹) 1982-85

	Winter wheat				Spring barley			
	1982	1983	1984	1985	1982	1983	1984	1985
N Straight	148	167	171	181	34	51	44	53
Compound	18	16	16	11	60	57	54	49
Total	166	182	187	192	94	107	98	102
P ₂ O ₅	51	51	56	54	38	39	39	38
K ₂ O	45	46	53	52	41	44	44	44

Average N use on sugar beet, well above general recommendations for some time, has recently tended to fluctuate from year to year, but was well down at 126 kg ha⁻¹ in 1985 compared with 148 kg ha⁻¹ the previous year. Estimated use of P and K on sugar beet was also less in 1985.

Recent years have shown small increases in lime use, but in 1984/5, 5.5% of the crops and grass area was treated with lime compared with 7.5% in 1983/4. The smaller use this year was probably because of unfavourable weather conditions in autumn 1984.

The average amounts of fertilizer nutrients used per hectare in 1985 on individual tillage crops, and on grassland classified according to utilization, and the proportions of each crop which got different amounts of nutrients are summarized in Tables 3-8 at the end of this paper.

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TABLE 3
Fertilizer use in England and Wales, 1985

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	43	145	45	52	99	95	95	26	146	48	55
Winter wheat	3651	192	54	52	100	87	82	11	192	62	63
Spring barley	1187	102	38	44	99	91	90	29	103	41	48
Winter barley	1926	150	55	58	100	94	92	14	151	58	63
Spring oats	60	70	35	39	96	93	93	36	73	37	42
Winter oats	225	119	57	59	100	93	94	12	119	62	62
Rye	46	130	41	53	97	80	87	26	135	52	61
Maize	22	74	45	45	78	67	67	75	96	67	67
Early potatoes	57	194	186	243	100	100	100	45	194	186	243
Maincrop potatoes	331	198	209	278	99	100	100	41	201	210	278
Sugar beet	455	126	56	137	99	93	99	33	127	60	138
Oilseed rape	591	272	58	55	100	94	87	8	272	62	64
Swedes (stock)	63	56	93	73	89	93	81	44	63	100	90
Turnips (stock)	70	73	51	53	98	84	83	54	75	60	64
Kale and cow cabbage	48	106	45	47	95	79	79	59	111	58	60
Rape for stockfeed	28	94	50	43	100	65	81	8	94	76	53
Beans for stockfeed	121	47	2	35	13	57	51	10	18	61	57
Other stockfeed	83	73	52	61	71	87	83	38	102	61	74
Peas for human consumption	296	4	23	31	18	44	48	8	21	53	63
Runner and French beans	27	152	60	86	91	89	89	14	167	67	96
Brussels sprouts	36	209	109	204	100	100	100	13	209	110	205
Cabbages	58	175	71	152	98	86	92	28	178	83	166
Cauliflower	47	192	106	193	92	93	93	35	209	113	207
Onions	41	133	81	157	100	87	97	9	133	93	162
Small fruit	45	48	19	81	76	50	81	4	63	38	100
Top fruit	59	48	15	26	50	40	50	7	96	37	53
All tillage	9954	161	56	63	95	88	86	16	169	64	74
1 year leys	66	180	34	46	99	73	73	23	181	47	63
2-7 year leys	2900	185	33	50	96	77	80	49	194	42	62
Permanent grass	4131	2815	102	19	79	59	58	36	130	32	38
All crops and grass	17051	8746	146	40	90	77	76	28	163	52	63

* The average application of any fertilizer 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	43	1	0	3	2	8	13	22	47	4	0	0	0
Winter wheat	3651	0	0	0	0	2	4	9	37	40	6	1	0
Spring barley	1187	1	1	9	21	19	22	15	11	2	0	0	0
Winter barley	1926	0	0	1	2	6	13	28	41	8	1	0	0
Spring oats	60	4	3	24	34	28	3	2	2	0	0	0	0
Winter oats	225	0	0	2	7	14	36	20	18	1	0	0	0
Rye	46	3	4	1	5	8	26	23	15	10	4	0	0
Maize	22	22	8	12	4	21	15	11	8	0	0	0	0
Early potatoes	57	0	1	1	0	0	13	4	35	28	12	5	0
Maincrop potatoes	331	1	0	0	2	2	2	8	37	28	17	2	0
Sugar beet	455	1	1	3	4	12	25	32	20	2	0	0	0
Oilseed rape	591	0	0	0	0	1	0	1	2	22	44	29	0
Swedes (stock)	63	11	5	35	22	18	2	5	1	0	0	0	0
Turnips (stock)	70	2	7	34	13	21	9	9	5	0	0	0	0
Kale and cow cabbage	48	5	3	15	12	9	19	24	10	0	1	3	0
Rape for stockfeed	28	0	0	17	18	38	10	8	6	0	3	0	0
Beans for stockfeed	121	87	10	2	0	1	0	0	0	0	0	0	0
Other stockfeed	83	29	5	13	12	12	6	7	14	4	0	0	0
Peas for human consumption	296	82	15	1	2	0	0	0	0	0	0	0	0
Runner and French beans	27	9	0	0	0	0	18	11	58	2	3	0	0
Brussels sprouts	36	0	0	0	0	4	16	8	33	6	5	28	0
Cabbages	58	2	0	11	4	3	5	9	22	28	13	3	0
Cauliflower	47	8	0	3	7	0	22	3	9	7	26	15	0
Onions	41	0	0	8	9	27	19	0	13	9	15	0	0
Small fruit	45	24	24	10	6	4	29	0	2	0	0	0	0
Top fruit	59	50	1	19	4	4	0	8	13	0	0	0	0
All tillage	9954	5	1	2	4	6	9	14	28	21	6	2	0
1 year leys	66	1	0	6	7	6	13	8	25	13	8	8	4
2-7 year leys	2900	4	1	8	9	8	6	10	14	10	12	13	5
Permanent grass	4131	21	3	13	14	9	7	7	10	5	4	4	1
All crops and grass	17051	10	2	7	8	7	8	11	20	14	7	5	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	43	5	11	47	34	1	2	0	0	0	0	0	0
Winter wheat	3651	13	3	17	52	12	2	0	1	0	0	0	0
Spring barley	1187	9	21	44	24	2	0	0	0	0	0	0	0
Winter barley	1926	6	5	23	54	10	1	0	1	0	0	0	0
Spring oats	60	7	33	43	14	4	0	0	0	0	0	0	0
Winter oats	225	7	4	13	66	8	1	0	0	0	0	0	0
Rye	46	20	14	16	42	7	0	0	0	0	0	0	0
Maize	22	33	9	31	13	0	6	0	8	0	0	0	0
Early potatoes	57	0	1	1	7	0	1	17	30	37	1	6	0
Maincrop potatoes	331	0	0	1	2	3	3	4	35	24	17	9	0
Sugar beet	455	7	7	35	29	13	5	0	2	0	0	0	0
Oilseed rape	591	6	2	16	62	11	2	0	0	0	0	0	0
Swedes (stock)	63	7	6	8	22	23	17	7	4	1	0	4	0
Turnips (stock)	70	16	30	17	14	9	10	1	0	2	1	0	0
Kale and cow cabbage	48	21	18	23	22	7	4	0	3	0	1	0	0
Rape for stockfeed	28	35	7	30	4	7	8	0	7	2	0	0	0
Beans for stockfeed	121	43	2	14	31	7	1	0	2	0	0	0	0
Other stockfeed	83	13	8	17	47	8	4	0	2	0	0	0	0
Peas for human consumption	296	56	1	16	24	1	1	1	0	0	0	0	0
Runner and French beans	27	11	6	15	50	11	0	0	8	0	0	0	0
Brussels sprouts	36	0	0	13	24	20	8	6	25	5	0	0	0
Cabbages	58	14	1	33	23	5	8	1	14	0	0	0	0
Cauliflower	47	7	0	4	32	17	5	11	18	7	0	0	0
Onions	41	13	1	10	45	8	3	8	6	6	0	0	0
Small fruit	45	50	27	11	4	8	0	0	0	0	0	0	0
Top fruit	59	60	20	16	3	1	0	0	0	0	0	0	0
All tillage	9954	12	6	22	45	9	2	1	2	1	0	0	0
1 year leys	66	27	22	30	7	10	2	2	0	0	0	0	0
2-7 year leys	2900	23	28	30	11	4	1	0	2	0	0	0	0
Permanent grass	4131	41	33	17	5	1	1	0	0	0	0	0	0
All crops and grass	17051	23	19	22	26	6	1	0	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	43	5	7	28	56	2	0	2	0	0	0	0	0
Winter wheat	3651	18	3	17	47	12	3	1	0	0	0	0	0
Spring barley	1187	10	13	36	36	3	1	0	0	0	0	0	0
Winter barley	1926	8	4	19	53	12	3	1	1	0	0	0	0
Spring oats	60	7	25	38	26	4	1	0	0	0	0	0	0
Winter oats	225	6	3	17	62	7	4	0	0	0	0	0	0
Rye	46	13	10	21	37	14	0	5	0	0	0	0	0
Maize	22	33	9	31	13	0	6	0	8	0	0	0	0
Early potatoes	57	0	1	0	0	0	2	6	16	46	3	25	0
Maincrop potatoes	331	0	1	0	1	1	1	3	7	22	29	34	2
Sugar beet	455	1	1	2	11	16	16	9	27	15	1	0	0
Oilseed rape	591	13	1	11	59	12	2	0	1	0	0	0	0
Swedes (stock)	63	19	6	3	20	33	5	10	2	0	1	0	0
Turnips (stock)	70	17	19	16	27	8	9	0	3	1	0	0	0
Kale and cow cabbage	48	21	18	10	34	6	10	0	0	0	0	1	0
Rape for stockfeed	28	19	7	37	25	3	3	5	0	0	0	0	0
Beans for stockfeed	121	49	1	16	28	4	1	0	0	0	0	0	0
Other stockfeed	83	17	3	16	34	15	4	5	2	2	0	0	0
Peas for human consumption	296	52	1	9	35	1	1	1	1	0	0	0	0
Runner and French beans	27	11	0	6	37	19	12	7	0	5	4	0	0
Brussels sprouts	36	0	0	0	0	2	11	8	17	55	7	0	0
Cabbages	58	8	0	0	2	7	19	18	16	14	14	0	0
Cauliflower	47	7	0	0	5	0	3	10	17	40	17	1	0
Onions	41	3	0	0	10	3	8	17	25	24	8	0	0
Small fruit	45	19	3	8	25	9	7	0	28	0	0	0	0
Top fruit	59	50	13	8	24	3	1	0	0	0	0	0	0
All tillage	9954	14	4	18	43	10	3	1	2	2	1	1	0
1 year leys	66	27	20	13	19	3	7	6	4	0	0	0	0
2-7 year leys	2900	20	20	21	16	7	7	6	3	0	0	0	0
Permanent grass	4131	42	27	19	7	2	2	1	0	0	0	0	0
All crops and grass	17051	24	14	19	27	7	3	2	2	1	0	0	0

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TABLE 7
Fertilizer use on grassland classified by utilization†

	Fields	% Grassland area			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					
Paddock grazed																
Not mown	121	2	181	15	22	83	46	49	30	217	33	45				
Mown	95	1	209	26	44	95	68	74	60	219	38	60				
All paddock grazed	216	4	192	20	31	88	55	59	42	218	36	53				
Strip grazed																
Not mown	117	2	230	23	27	98	69	69	50	234	33	39				
Mown	178	2	204	24	46	96	79	83	69	213	30	55				
All strip grazed	295	4	216	23	37	97	74	77	60	223	31	48				
Set stocked																
Not mown	905	13	161	24	23	89	67	66	29	181	35	35				
Mown	851	11	188	33	57	95	79	82	64	197	42	70				
All set stocked	1756	24	173	28	39	92	73	73	44	188	38	52				
Other grazings																
Not mown	2512	39	80	19	17	74	57	55	25	108	34	31				
Mown	1980	25	143	27	45	92	72	76	59	155	37	59				
All other grazings	4492	64	105	22	28	81	63	63	38	129	35	44				
All grazings	6759	95	130	24	31	85	66	66	41	153	36	47				
Cut for seed																
Not grazed	22	0	149	59	69	94	87	76	14	158	68	91				
All cut for seed	36	0	160	46	56	97	78	74	11	166	59	75				
Cut for silage																
Not grazed	132	2	240	39	84	99	78	86	47	242	49	98				
Grazed extensively	1090	13	192	33	62	98	79	84	67	196	41	74				
Grazed intensively	757	10	230	36	66	100	85	89	70	230	42	74				
All cut for silage	1979	25	211	34	65	99	82	86	67	213	42	76				
Cut for hay																
Not grazed	119	1	112	12	18	95	33	45	37	118	35	39				
Grazed extensively	834	11	84	21	25	84	65	66	49	100	32	38				
Grazed intensively	409	5	103	18	25	85	60	63	51	120	31	39				
All cut for hay	1362	17	91	19	25	85	62	64	49	107	32	38				
All mowings	3377	42	163	28	49	93	74	77	59	174	39	64				
Not stated/not used	108	2	68	23	19	62	48	47	13	109	48	40				
All grass	7140	100	131	24	32	85	65	66	40	154	36	48				

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

†Note that fields which are both grazed and mown will appear in both the grazing and mowing sections of the table.

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TABLE 8
Percentages of grassland area getting different amounts of N (kg ha^{-1})

Fields	0	<25	25-	50-	75-	100-	125-	150-	200-	250-	300-	400+
Paddock grazed												
Not mown	17	1	10	2	4	9	6	5	9	16	17	5
Mown	5	2	2	4	4	5	12	25	11	5	14	10
All paddock grazed	12	2	7	3	4	8	9	13	10	11	16	7
Strip grazed												
Not mown	2	0	3	12	4	6	8	13	5	10	26	10
Mown	4	2	2	4	5	3	13	14	18	16	13	5
All strip grazed	3	1	3	8	5	4	10	14	12	13	19	7
Set stocked												
Not mown	11	2	6	13	7	8	6	15	9	9	9	5
Mown	5	1	5	8	10	6	7	17	13	11	15	4
All set stocked	1756	8	1	11	8	7	6	16	10	10	12	4
Other grazings												
Not mown	26	3	18	15	10	6	8	6	3	4	2	1
Mown	8	1	11	13	10	7	9	15	9	8	7	2
All other grazings	4492	19	2	15	14	10	8	10	5	5	4	1
All grazings	6759	15	2	12	13	9	8	11	7	7	7	3
Cut for seed												
Not grazed	22	6	2	0	3	15	14	47	12	0	0	0
All cut for seed	36	3	1	4	12	14	8	34	16	6	2	0
Cut for silage												
Not grazed	132	1	1	4	4	12	12	10	12	7	33	5
Grazed extensively	1090	2	5	7	9	7	10	18	12	14	12	5
Grazed intensively	757	0	1	4	7	4	6	20	17	15	19	6
All cut for silage	1979	1	3	5	8	6	9	18	14	14	16	5
Cut for hay												
Not grazed	119	5	9	24	19	13	7	10	8	6	1	0
Grazed extensively	834	16	19	22	12	7	8	9	4	2	1	0
Grazed intensively	409	15	12	14	11	8	12	14	6	1	3	0
All cut for hay	1362	15	2	20	12	7	9	11	5	2	1	0
All mowings	3377	7	1	11	9	7	9	15	10	9	10	3
Not stated/not used	108	38	3	2	8	2	17	3	1	1	4	1
All grass	7140	15	2	12	9	6	8	11	7	7	7	3