

36 Fertilizers

This Report on the Fertilisers Industry relates to establishments engaged wholly or mainly in manufacturing or compounding artificial fertilisers.

This industry corresponds to minimum list heading 278 in the Standard Industrial Classification (Revised 1968) which has been used for the first time as a basis of classification in the 1968 Census.

The industry was included in the Fertilisers and Chemicals for Pest Control Industry (Part 26) in the Reports on the last detailed Census of Production for 1963, except that ammonium nitrate (other than mixed with lime or chalk) and ammonium phosphates were shown in the Report on General Chemicals (Part 27). The manufacture of chemicals for pest control which were shown as sub-divisions of the industry in the 1963 Report are now the subject of a separate Report for 1968.

Throughout this Report, the figures given for 1963 have been reclassified as far as possible, according to the Standard Industrial Classification (Revised 1968) so that data for 1963 and 1968 are on the same industrial basis. However the reclassification of small firms, which provided limited information only, has been arbitrary. Comparability of figures between 1963 and 1968 is further affected in this industry, and elsewhere in the Chemical Order, by differences in the reporting units of large firms engaged in distinct processes of chemical and chemical products manufacture.

In interpreting the data in the tables it is essential to bear in mind the notes and definitions which appear on pages (i) to (iv).

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TABLE 1 Industry summary, 1963 and 1968 (a)
United Kingdom (b) (c)

	Unit	All establishments		
		1963	1968	
Number of enterprises	No.	149	121	
Number of establishments	"	194	176	
Gross output	£'000	124,047	232,266	
Net output	"	36,747	70,924	
Net output per head	£	2,041	3,674	
Sales and work done	£'000	goods produced and work done (d)	112,924	189,679
		merchanted goods and canteen takings	11,038	39,195
Purchases	"	materials for use in production and packaging and fuel	69,991	115,663
		goods for merchandising and canteen purchases	10,036	33,026
Payments to other organisations	"	for work done on materials given out	9	2
		for transport	7,145	9,309
		by road		
Stocks and work in progress	"	by rail and other means excluding postal services	3,693	3,693
		change during year			- 35	+ 3,743
Total stocks and work in progress	"	at end of year	19,177	24,504
		change during year	- 59	+ 3,242
Goods on hand for sale	"	at end of year	9,289	13,105
		change during year	+ 143	+ 151
Work in progress	"	at end of year	635	2,416
		change during year	- 120	+ 351
Materials, stores and fuel	"	at end of year	9,253	8,984
		total, including working proprietors	Th.	18.0	19.3
Number employed on average during the year	"	operatives	12.0	13.1
		other employees (e)	5.9	6.1
		of operatives	£'000	9,822	15,597
Wages and salaries	"	of other employees (e)	6,562	11,228
		Total	"	10,146	8,333
Capital expenditure (f)	"	814	570	
Total	"	- 41	- 70	
New building work	"	9,159	7,570	
Land and existing buildings (g)	"	214	262	
Plant and machinery (g)	"			
Vehicles (g)	"			

(a) The 1963 and 1968 figures in this table are not strictly comparable - see paragraph 4 of the introduction to this report.

(b) For 1968, estimates for establishments not making satisfactory returns and for small establishments, from which only employment data were collected, accounted for 6 per cent. of the total figures in which they were incorporated: of this, unsatisfactory returns accounted for 1 per cent. For 1963 the comparable figures were 7 per cent. and 1 per cent. respectively.

(c) The following information relates to small establishments (employing fewer than 25 persons) in this industry. It includes an estimate for small establishments not making satisfactory returns.

	1963	1968
Number of establishments	124	116
Average number employed:		
Working proprietors	141	107
Other persons employed	1,069	1,047

Footnotes continued on page 36/2.

Footnotes continued from page 36/3.

(d) Including services rendered to other organisations (amounts charged for hiring out plant, machinery or other goods, for providing transport, or for technical or other services rendered).

(e) Administrative, technical and clerical employees.

(f) Excluding expenditure for establishments not yet in production.

(g) Acquisitions less disposals.

TABLE 2 Analysis by size of establishment within the industry, 1968

(i) Output and employment

All establishments: United Kingdom

Number employed on average during the year by the establishment (a)	Estab-lish-ments	Enter-prises (b)	Total number employed on average during the year (a)	Gross output	Net output	Net output per head
1-5	27	27	90	..	..	..
6-10	26	24	200	..	..	..
11-24	37	36	679	..	..	..
25-49	9	8	330	4,141	796	2,411
50 and over	49	14	17,745	213,275	65,604	3,697
Unsatisfactory returns	28	23	260	..	..	..
Total	176	121	19,304	232,266(c)	70,924(c)	3,674(c)

(ii) Employees, wages and salaries

All establishments: United Kingdom

Number employed on average during the year by the establishment (a)	Employees		Wages and salaries		Wages and salaries per head	
	Oper-atives	Others (d)	Oper-atives	Others (d)	Oper-atives	Others (d)
	Number	Number	£'000	£'000	£	£
1-5	..	..	..	..	..	..
6-10	..	..	..	..	..	..
11-24	..	..	..	..	..	..
25-49	235	93	222	99	944	1,063
50 and over	12,057	5,684	14,468	10,478	1,200	1,843
Unsatisfactory returns	..	..	..	..	..	..
Total	13,052(c)	6,139(c)	15,597(c)	11,228(c)	1,195(c)	1,829(c)

(a) Including working proprietors.

(b) The sum of the figures for the size groups exceeds the total for the industry to the extent that enterprises made returns for establishments in more than one size group.

(c) Including estimates for establishments employing fewer than 25 persons and for establishments not making satisfactory returns.

(d) Administrative, technical and clerical employees.

TABLE 3 Percentage analysis of employees, by age and sex, 1969 (a)

All establishments: United Kingdom

Ages	Males	Females	All employees
	Per cent.	Per cent.	Per cent.
Under 18	1	2	3
18 and over	78	19	97
All ages	79	21	100

Source: Department of Employment

(a) The percentages relate to the numbers employed (excluding working proprietors) at June 1969, the earliest date for which the information is available on the basis of the Standard Industrial Classification, (Revised 1968).

Footnotes to Table 4.

- (a) The 1963 and 1968 figures in this table are not strictly comparable - see paragraph 4 of the introduction to this report.
- (b) Some establishments employing fewer than 25 persons were included in returns for larger establishments. These amounted to 5 establishments in 1968 and 13 in 1963.
- (c) Including services rendered to other organisations (amounts charged for hiring out plant, machinery or other goods, for providing transport, or for technical or other services rendered).
- (d) Direct sales of goods (excluding canteen takings) made to, and work done for, the general public by larger establishments are included. These amounted to £109,000 in 1968. Similar information is not available for 1963.
- (e) This is the ratio of total sales of principal products by the industry to total sales of goods produced and work done.
- (f) Administrative, technical and clerical employees.
- (g) Excluding expenditure for establishments not yet in production.

TABLE 4 Analysis of larger establishments, 1963 and 1968 (a)
Establishments employing 25 or more persons: Analysis of returns received,
United Kingdom (b)

	Unit	1963	1968	
Number of enterprises	No.	36	20	
Number of establishments	"	81	63	
Gross output	£'000	115,449	218,213	
Net output	"	34,200	66,632	
Net output per head	£	2,041	3,674	
Sales and work done	{ goods produced and work done (c) (d) merchanted goods and canteen takings	£'000	105,097	178,202
Index of specialisation (e)	Per cent.	97	75	
Purchases	{ materials for processing and packaging, and fuel goods for merchandising and canteen purchases	£'000	65,139	108,665
Payments to other organisations	{ for work done on materials given out for transport by road by rail and other means excluding postal services	"	8	2
Stocks and work in progress			8,745	3,470
Goods on hand for sale	{ change during year at end of year	"	- 55	+ 3,046
Work in progress	{ change during year at end of year	"	+ 133	+ 142
Materials, stores and fuel	{ change during year at end of year	"	591	2,270
Number employed on average during the year	{ total, including working proprietors operatives other employees (f)	No.	16,756	18,136
Wages and salaries	{ of operatives of other employees (f)	£'000	9,210	14,734
Wages and salaries per head	{ operatives other employees (f)	£	6,157	10,608
Capital expenditure (g)			819	1,195
New building work		£'000	1,121	1,829
Land and existing buildings	{ acquisitions disposals	"	758	536
Plant and machinery	{ acquisitions disposals	"	38	8
Vehicles	{ acquisitions disposals	"	77	74
		"	8,614	7,286
		"	90	174
		"	290	385
		"	91	139

For notes to this table - see page 36/5.

TABLE 5 Sales of principal products of the industry by larger establishments, including sales by establishments classified to other industries, 1963 and 1968 (a)
Establishments employing 25 or more persons: Analysis of returns received, United Kingdom

	1963		1968		Enter-prises	Entries	
	Quantity	Value	Quantity	Value			
		£'000		£'000	Number	Number	
Ammonium nitrate (other than mixed with lime or chalk) in terms of N	..	1,914	..	1,143	5	6	
Ammonium phosphates	..	569	..	3,485	*	6	
Fertilisers, prepared or manufactured							
Simple fertilisers							
Phosphatic (in terms of P ₂ O ₅)			Th. tons				
Basic slag, ground	..	2,925	70.4	2,609	*	5	
Phosphate rock, ground	..	307	4.4	151	9	12	
Calcium superphosphate							
Single	..	1,640	..	1,172	8	11	
Triple	..	725	25.1	1,500	*	5	
Nitrogenous (in terms of N)							
Ammonium sulphate (b)			313	9,190	12	40	
Ammonium nitrate mixed with lime or chalk	..	29,414	693	17,226	*	*	
Other			377	12,495	*	6	
Compound fertilisers	Th. tons	2,871	70,133	2,864	89,652	27	42
Other prepared or manufactured fertilisers							
Meat meal, meat and bone meal, bone meal, steamed bone flour and meal, and hoof and horn meal	{ 20.3 ..	{ 544 433	{ 11.7 ..	{ 346 102	{ 12	{ 15	
Other	{ 22.2 ..	{ 814 101	{ 25.5	{ 1,231	{ 8	{ 9	
Other products	..	84	..	58	*	*	
Waste products	..	30	..	249	6	8	
Work done		5		148	*	*	
Total		109,638		140,755	..	..
Sales in other industries (see Table 6)		7,872		7,206	..	..
Principal products of this industry sold by establishments in the industry		101,766		133,549	20	37(c)	

(a) The 1963 and 1968 figures in this table are not strictly comparable - see paragraph 4 of the introduction to this report.

(b) Including sales of ammonium sulphate returned by undertakings classified to the Gas Industry in which particulars were required from all undertakings.

(c) This figure represents the total number of returns made for larger establishments in this industry which is less than the total number of establishments shown in Table 4 on account of combined returns covering more than one establishment.

TABLE 6 Sales of principal products of the industry by larger establishments classified to other industries, 1963 and 1968 (a)
Establishments employing 25 or more persons: Analysis of returns received, United Kingdom

	1963		1968			
	Quantity	Value	Quantity	Value	Entries	Principal industries in which produced (b)
		£'000	Th. tons	£'000	Number	
Fertilisers, prepared or manufactured						
Nitrogenous ammonium sulphate (in terms of N)	..	3,283	216	3,356	36	24,27,28,152
Compound fertilisers	..	881	46.8	1,285	11	15,27,29
Meat meal, meat and bone meal, bone meal, steamed bone flour and meal, and hoof and horn meal	..	580	11.6	342	13	10,15,16,38
			..	90		
Other	..	3,127	..	2,133	9	16,27,39,40
Total		7,872		7,206	..	

(a) The 1963 and 1968 figures in this table are not strictly comparable - see paragraph 4 of the introduction to this report.

(b) The references given are to the list of industries at the front of this report.

TABLE 7 Sales of other than principal products by larger establishments in the industry, 1963 and 1968 (a)

Establishments employing 25 or more persons:
Analysis of returns received, United Kingdom

	1963		1968	
	Quantity	Value	Quantity	Value
	Th. tons	£'000	Th. tons	£'000
Sulphuric acid including oleum (in terms of 100 per cent. acid) (b)	42.9	348	205	1,702
Other products and services rendered (c)	..	2,983	..	42,952
Total value of goods sold without having been subjected to any manufacturing process (merchanted or factored)	..	10,186	..	36,485
Canteen takings		87		338
Total		13,603		81,476

(a) The 1963 and 1968 figures in this table are not strictly comparable - see paragraph 4 of the introduction to this report.

(b) 'Oleum' was not specifically included for 1963.

(c) Services rendered comprises amounts charged for hiring out plant, machinery or other goods, for providing transport, or for technical or other services rendered to other organisations.

TABLE 8 Production of certain principal products of the industry by larger establishments, 1968

Establishments employing 25 or more persons:
Analysis of returns received, United Kingdom

	1968					
	Returned in this industry			Returned in all industries		
	Quantity	Enter-prises	Entries	Quantity	Enter-prises	Entries
	Th. tons	Number	Number	Th. tons	Number	Number
Ammonium nitrate (other than mixed with lime or chalk) in terms of N	*	*	*	159	5	6
Ammonium phosphates	*	*	*	244	*	5
Simple fertilisers						
Phosphatic (in terms of P ₂ O ₅)						
Basic slag, ground	81	*	5	81	*	5
Phosphate rock, ground	*	*	*	232	9	12
Calcium superphosphate						
Single	*	*	*	71	8	11
Triple	36	*	5	36	*	5
Nitrogenous (in terms of N)						
Ammonium sulphate	124	*	*	346	14	42
Ammonium nitrate mixed with lime or chalk	675	*	*	693	*	*
Other	460	*	8	460	*	8

TABLE 9 Purchases by larger establishments of selected principal products of the industry, 1968

This table is not applicable to this industry.

TABLE 10 Purchases by larger establishments in the industry, 1963 and 1968 (a)
Establishments employing 25 or more persons: Analysis of returns received, United Kingdom

	1963		1968	
	Quantity	Cost	Quantity	Cost
Materials for use in production		£'000		£'000
Sulphur	..	1,544	..	3,977
Sulphur containing materials (including anhydrite, pyrites, spent oxide, but excluding sulphur)	..	956	..	253
Basic slag (unground)	..	912	..	1,001
Phosphate rock (mineral phosphate of lime), unground (b)	..	6,436	..	7,487
Fish meal and meat meal and mixtures of meat and bone meals, bone and bone pieces	..	366	..	260
Filling materials not elsewhere specified (eg cocoa shell, peat, hops, slate dust, diatomite, etc)	..	121	..	118
Naphtha, light petroleum oils	..	(c)	..	10,418
General chemicals (d)				
Inorganic (including inorganic gases)				
Ammonia, synthetic and by-product (e)	..	4,019	..	14,928
Nitric acid	..	568	..	1,224
Sulphuric acid and oleum (f)	..	1,703	..	2,726
Phosphoric acid and other inorganic chemicals	..	1,425	..	4,149
Organic (including organic gases)				
Urea	..		..	1,904
Other organic chemicals	..	3,657	..	600
Other (eg mixtures of inorganic and organic chemicals) (g)	..	603	..	292
Calcium superphosphate				
Single	..	792	..	916
Triple	..	642	..	2,411
Potassium salts				
Chloride (muriate)	..	8,937	..	8,264
Other potassium salts (including sulphate)	..	305	..	744
Ammonium sulphate	..	9,664	..	5,392
Ammonium phosphates	..	930	..	2,283
Nitrogenous fertilisers, not elsewhere specified (including mixtures of nitrogenous fertilisers) (h)	..	1,800	..	1,269
Lubricating oils and greases	Th.gal. 161	33	Th.gal. 516	91
	Th.cwt. 0.4	2	Th.cwt. 0.3	2
Replacement parts for firms' own machinery, plant and vehicles, and accessories and consumable tools bought as replacement				
Tyres and other spare parts for firms' own road goods vehicles	..	2,390	..	206
Other	..		..	4,646
All other materials for use in production	..	5,761	..	15,363

TABLE 10 (continued)

	1963		1968	
	Quantity	Cost	Quantity	Cost
Packaging materials		£'000		£'000
Paper and board				
Boxes, cartons, drums and canisters (with or without metal ends) of paper and cardboard	..	56	..	115
Bags and multiwall paper sacks (i)	..	2,597	..	623
Jute and hessian piece-goods, sacks and bags	..	523	..	506
All other packaging materials including plastic bags and sacks	..	1,629	..	3,071
Fuel and electricity (j)				
Coal	Th. tons 570	2,671	..	5,429
Coke (including screenings) and manufactured fuel	69.7	590	..	81
Derv fuel and motor spirit for use in road vehicles	Th.gal. 467	91	Th.gal. 897	198
Other liquid fuels (including creosote/pitch mixtures, etc and liquefied petroleum gases)	17,516	659	25,602 ..	1,091 122(k)
Gas	Th. therms 13,241	360	Th. therms 5,519	186
Electricity	Th.kWh 532,794	2,397	Th.kWh 1,441,475	6,317
Total cost of materials and fuel		65,139		108,665
Goods purchased for merchanting		9,248		30,738
Canteen purchases		93		289
Total cost of purchases		74,479		139,692

- (a) The 1963 and 1968 figures in this table are not strictly comparable - see paragraph 4 of the introduction to this report.
- (b) Not specified as unground for 1963.
- (c) Not recorded separately for 1963.
- (d) For 1963 described as 'Heavy chemicals (acids, alkalis, alcohols, other inorganic and organic chemicals, compressed gases, etc)'.
(e) For 1963 described as 'Ammonia (liquor and anhydrous)'.
(f) For 1963 oleum was not specifically included.
(g) For 1963 described as 'Other heavy chemicals'.
(h) For 1963 mixtures of nitrogenous fertilisers were not specifically included.
(i) For 1963 bags were not specifically included.
(j) The total quantity of electricity generated in establishments employing 25 or more persons in this industry was 98,862 Th.kWh in 1963. Owing to the risk of disclosure of information relating to individual firms the quantity for 1968 cannot be given.
(k) For 1968 may include a small amount of fuels not covered by specific headings.

TABLE 11 Transport costs and employment of larger establishments, 1963 and 1968 (a)

Establishments employing 25 or more persons:
Analysis of returns received, United Kingdom

	Unit	1963	1968
Average number mainly employed on transport	No.	246	849
Transport costs			
Wages and salaries	£'000	189	1,089
Derv fuel and motor spirit	"	91	198
Tyres and other spare parts for road goods vehicles	"	..	206
Payments to other organisations for transport	{ by road by rail and other means excluding postal services	{ 6,649	{ 8,745
Costs of operating road goods vehicles			3,470
Insurance	"	10	22
Vehicle licences	"	17	62
Depreciation	"	72	340
Payments to other organisations for repairs and maintenance	"	46	67
Total	"	7,076(b)	14,200

(a) The 1963 and 1968 figures in this table are not strictly comparable - see paragraph 4 of the introduction to this report.

(b) Excluding tyres and other spare parts for road goods vehicles, not collected separately for 1963.

TABLE 12 Payments for certain services, etc by larger establishments, 1963 and 1968 (a) (b)

Establishments employing 25 or more persons:
Analysis of returns received, United Kingdom

	Amounts payable	
	1963	1968
Repairs and maintenance to	£'000	£'000
Buildings	143	239
Road goods vehicles	46	67
Plant, machinery and other capital equipment	545	2,310
Insurance, licensing and depreciation of road goods vehicles (c)	100	424
Rates, excluding water rates	778	1,685
Hire of plant and machinery	7	895
Postage, telephone, telegrams, cables and telex (d)	220	407
Total	1,839	6,028

(a) The 1963 and 1968 figures in this table are not strictly comparable - see paragraph 4 of the introduction to this report.

(b) No deduction is made for these payments to arrive at the figures of net output given in this report.

(c) For details see Table 11.

(d) Excluding telex for 1963.

TABLE 13 Percentage analysis of twelve-month periods covered by returns from larger establishments, 1968

Establishments employing 25 or more persons:
Analysis of returns received, United Kingdom

Year ended	Percentage of total returns received	Percentage of total number employed
1968	Per cent.	Per cent.
April (a)	0.0	0.0
May	2.7	0.3
June	37.9	23.6
July	0.0	0.0
August	0.0	0.0
September	29.7	8.1
October	0.0	0.0
November	0.0	0.0
December	29.7	68.0
1969		
January	0.0	0.0
February	0.0	0.0
March	0.0	0.0
April (b)	0.0	0.0
	100	100

(a) From 6 April.

(b) To 5 April.

TABLE 1. Summary of results of field trials conducted in 1951-52 at various locations in the State of Michigan.

Location	Treatment	Yield (bushels/acre)	Quality (index)
East Lansing	Control	25.0	85
	Fertilizer	32.0	88
Houghton	Control	28.0	82
	Fertilizer	35.0	85
Lansing	Control	30.0	80
	Fertilizer	38.0	83
Muskegon	Control	22.0	78
	Fertilizer	30.0	81
Plymouth	Control	26.0	79
	Fertilizer	34.0	82
Saginaw	Control	24.0	77
	Fertilizer	32.0	80
Traverse City	Control	27.0	76
	Fertilizer	36.0	79
Westland	Control	29.0	75
	Fertilizer	37.0	78

1. Fertilizer applied at rate of 100 lbs/acre of 16-16-16.

2. Control plots received no fertilizer.

Location	Treatment	Yield (bushels/acre)	Quality (index)
East Lansing	Control	25.0	85
	Fertilizer	32.0	88
Houghton	Control	28.0	82
	Fertilizer	35.0	85
Lansing	Control	30.0	80
	Fertilizer	38.0	83
Muskegon	Control	22.0	78
	Fertilizer	30.0	81
Plymouth	Control	26.0	79
	Fertilizer	34.0	82
Saginaw	Control	24.0	77
	Fertilizer	32.0	80
Traverse City	Control	27.0	76
	Fertilizer	36.0	79
Westland	Control	29.0	75
	Fertilizer	37.0	78

3. Fertilizer applied at rate of 100 lbs/acre of 16-16-16.