



THE FERTILISER ASSOCIATION OF IRELAND

THE SCENARIO FOR FERTILISER USAGE

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PRACTICAL ASPECTS OF FERTILISER USE

J. McCullen

THE ROLE OF FERTILISER IN MAXIMISING OUTPUT ON SMALL FARMS

J. O'Mahony

CO-OPERATION FOR AGRICULTURAL DEVELOPMENT

T. Walsh

SPRING MEETING—FEBRUARY 28th, 1983

Publication No. 23

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INTRODUCTION

Increasing concern has been expressed in recent times over the virtual stagnation in total fertiliser use, but particularly in regard to the decline in PK consumption. As indicated in Fig. 1, the trend in usage up to 1973/74 displayed a gradual increase with N outpacing the other nutrients in terms of growth. However, there has been an erratic evolution in usage since then with PK reaching a new peak in 1978/79 and N continuing to expand. It is worth noting, however, that P usage in 1978/79 did not reach its previous peak, but K consumption surpassed it by some 20% while N consumption in 1981/82 was over double its 1973/74 level.

A number of features can be adduced for this differential trend of nutrient usage. Firstly, the process of intensification inevitably means a faster growth in N than in P and K consumption. Secondly, the expansion in silage production is presumably responsible for the more robust performance of K relative to P since the mid-Seventies. Thirdly, while there may have been some substitution of N for P K, the relatively greater growth in N consumption is consistent with intensification occurring on a relatively small proportion of farms, despite little apparent change in the aggregate.

Certainly the consumption trend of fertiliser is strongly influenced by farmers' purchasing power and the stocking intensity of Irish agriculture. These factors are correlated, however weakly, and indeed the average stocking intensity as measured in the Farm Management Survey has declined from 2.23 ac/LU in 1979 to 2.48 ac/LU in 1981. It is anticipated that a further deterioration may have occurred in 1982.

The foregoing comments relate to developments in the aggregate. As far as individual producers are concerned, adjustments to the level of fertiliser consumption can only be decided in the context of the circumstances prevailing on the farms concerned. Where fertiliser is used optimally, an increase in the product/fertiliser price ratio would tend to increase its consumption and vice-versa. It is doubtful, however, whether a large proportion of farms occupy this category, but rather they are operating below the profit-maximising level of fertiliser application. The experience of recent years suggests that the attainment of the optimum level of fertiliser input has been thwarted by the surge in overhead expenditure arising from volume and unit cost sources.

THE ECONOMIC AND POLICY BACKGROUND

The economic background to current and prospective opportunities in farming is now significantly influenced by developments in the European Economic Community (EEC) and international arena. Most people are now aware of the imbalance between supply and effective demand for many farm products. In the EEC, consumption has increased much slower than production, e.g. in 1982, 23% more milk was produced than in 1973, but consumption only increased by 6%. Over the same period sugar production increased by 42% but consumption declined by 10%. In the future, the food demands of the EEC are expected to increase more slowly than

in the past and the prospects on the world market are hardly more encouraging. Therefore, world demand may not be strong and competition between the major producers will be relentless. The response of the EEC Commission, as foreshadowed in the Mandate document, is indicated mainly under two headings:—

- a) Price levels,
- b) Price guarantees

Price Levels: A prudent policy will be pursued having regard to markets and incomes; the best example of this relates to cereals where the price gap between the Community and world levels will be reduced.

Price Guarantees: The Community will no longer be able to maintain guaranteed prices for unlimited quantities, regardless of the market. Producers will then be asked to participate in the cost of disposing of excess production by adjusting intervention prices by reference to guarantee 'thresholds'. This is now happening in the case of cereals, milk and sugar and could ultimately extend to more products of interest to Ireland.

Despite the unexciting prospects held out by imminent developments in supply and demand, the future is not all bleak. The EEC is conscious of its responsibility to support farm incomes and the Director-General for Agriculture in the Commission has said, "because last year was very good, it does not mean that this year we should destroy that progress by freezing prices". Additionally, the EEC Commission is opposed to stop-go price policies or ones which would accelerate unemployment. Contrary to the Mansholtian spirit of the early Seventies, it is now considered that any drift from the land is 'inopportune'.

With a scenario of modest price increases, especially in the context of the relatively high inflation rate prevailing here, there are still certain factors which give some confidence for the future. Although price rises will be very 'prudent' indeed, input costs have also moderated significantly. In 1983, the rise in input costs should be less than half that operating two years ago. Furthermore, world energy prices are now tending downwards which will enable greater moderation to be sustained in factor costs, and the element of price and market uncertainty, for the sector as a whole, has been less than for many years. As in every other sector of the economy there will be an inevitable winding down of expectations and it might be only frustrating to anticipate even a partial return to the halcyon days of the Seventies. Today, cost/price ratios are only about as good as they were in the late Sixties, but at least we have guaranteed markets and the burden of market support is borne by the EEC taxpayers, thus allowing scope for expansion in other Government programmes. Attitudes of defeatism or pessimism to the current situation in farming only inculcate despair, particularly if their advocates have no practical remedial measures to offer.

THE PRESENT SITUATION

After the dramatic reversal in farm performance in the years 1979–1981 there was at least the semblance of a recovery in 1982, as indicated in Table 1.

TABLE 1
Annual Change in Certain Indices

	1979/78	1980/79	1981/80	1982/81
		<i>Per Cent</i>		
Gross output — value	5	–1	14	12
Net output — value	–2	1	12	15
Income — nominal	–12	–8	14	24
Output price index	6	–3	19	8
Input price index	13	14	15	10
Volume — gross	–1	0	–2	3
Volume — net	–10	8	–5	6

While good weather conditions played a significant part last year in effecting improvement in incomes, the recovery is also a reflection of the cyclical upturn in the industry, allied to reasonably good cost/price relationships. A most heartening development also was the increase in the volume of gross and net output after the decline of recent times. The process of recovery is being curtailed by the decline or stagnation of the cattle breeding herd in recent years, although there are signs of a reasonably good recovery, especially in the dairy herd in the short-term. This should be boosted by the Calved Heifer Premium and Calf Subsidy Schemes. Expansion in sheep numbers is also indicated while the cereals acreage is not expected to change greatly.

The major issue confronting the agricultural sector is whether the improvement in performance realised last year can be sustained. In the short-term it is likely that the growth in cattle numbers will be maintained and this is critically important, but in the absence of a Green Currency devaluation, incomes may only keep pace with inflation this year. There is the advantage this year of the EEC marketing year being almost certainly introduced earlier, and the rate of increase in costs is expected to wind down further, but the reality of the current cost/price and income situation would suggest that little development in capital investment will be initiated which does not offer clear financial advantages. In these circumstances the allocation of farm expenditure will be concentrated on the acquisition of current inputs, which of course are the main instruments in the generation of output in the short-term at least.

FERTILISER IN FARM PRODUCTION

Fertiliser is one of the major inputs in farm production and accounted for about 16% of total farm expenses in 1982. The proportion of fertiliser expenditure in farm costs has been quite stable at about 10%, despite the erratic movement in the price and volume series.

The trends in the appropriate price series are shown in Table 2.

Table 2
Trend in Product and Fertiliser Prices

<i>Year</i>	<i>Fertiliser¹</i>	<i>Nitrogen</i>	<i>Cattle</i>	<i>Milk</i>	<i>Barley</i>
1970	100	100	100	100	100
1971	109	113	110	108	109
1972	120	121	142	132	113
1973	127	130	179	163	179
1974	210	193	164	193	199
1975	302	261	221	248	237
1976	309	262	287	283	298
1977	328	298	347	378	357
1978	339	318	413	412	357
1979	344	336	419	427	367
1980	414	396	424	419	355
1981	478	435	508	480	398
1982 ^e	508	489	559	529	416

Source: Mainly CSO. (1) e.g. 10:10:20

In general, the increase in fertiliser costs was greater than that of agricultural prices, but for some of the major farm products and with N in particular, the ratio has been exceeded, especially in the case of cattle and milk. The ratio will change little in the current year, but the relationship between product prices and input costs has not changed appreciably over the past decade.

The increase in fertiliser prices in recent times has been less spectacular than for any of the other major inputs as shown in Table 3.

TABLE 3
Input Price Indices (1975 = 100)

<i>Year</i>	<i>All</i>	<i>Fertiliser</i>	<i>Feed</i>	<i>Energy</i>
1975	100	100	100	100
1976	116	103	120	123
1977	141	112	156	143
1978	147	119	159	139
1979	165	130	177	172
1980	189	155	184	246
1981	216	172	202	322
1982 ^e	239	183	217	361

Source: CSO and Author's Estimates

While the input price index rose by almost 140% between 1975 and 1982, feed and energy costs rose by 117 and 261%, respectively, but fertiliser costs increased by a much lesser 83%. Thus, whether compared with the trend in product or factor prices, fertiliser costs are not cast in an unfavourable light.

The change in nutrient prices and consumption has altered the allocation of total expenditure by nutrient as indicated in Table 4. Whereas in 1970 expenditure on P and K accounted for 50 and 15% respectively of the total, these proportions had declined to 31 and 14% in 1982. By contrast the significance of N has increased from 35 to 55% over the same period and there is every indication that this trend will be maintained.

TABLE 4
Proportion of Fertiliser Expenditure on Individual Nutrients

	<i>N</i>		<i>P</i>		<i>K</i>		<i>Total</i>
<i>Year</i>	<i>IR£M</i>	%	<i>IR£M</i>	%	<i>IR£M</i>	%	<i>IR£M</i> %
1970	7	35	10	50	4	15	20 100
1976	37	44	33	39	15	17	85 100
1982	110	55	61	31	29	14	200 100

Source: Author's Estimates

THE ECONOMICS OF FERTILISER USE

Before embarking on a farm development programme which inevitably involves intensification by increasing fertiliser use, it is imperative to establish that the respective price ratios will facilitate the process. Using results from An Foras Taluntais response experimentation, relating to beef and milk production, the optimum levels of application are outlined, assuming no other inhibiting factors. In the case of beef production the physical maximum yield was obtained with an input of 234 lb/ac of N with adequate levels of P and K. The estimated optimum levels since 1970, taking the appropriate price indices into consideration, are shown in Table 5.

TABLE 5
Economic Optimum Levels of N (lb/ac) for Beef Production, 1970–82
Ratio of N price (p/lb) to cattle prices (p/lb)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
	.55	.49	.41	.35	.57	.58	.45	.42	.38	.37	.45	.42	.42
Economic Optimum (N lb/ac)	175	181	190	196	173	171	185	189	193	194	185	189	189

Source: N (CAN 27.5%), Cattle (10–11 cwt) – CSO * Estimate

Similar relationships for milk production are shown in Table 6 and again the prevailing level on farms is always considerably less. For beef and milk production, lower optimum levels will generally result in practice when investment and other costs are taken into consideration. However, despite changing price relativities, the optimum level of fertiliser application on grassland has changed little since the early Seventies. This would apply either to grazing or conservation.

TABLE 6
Economic Optimum Levels of N (lb/ac) for Milk Production 1970–82
Ratio of N price (p/lb N) to milk prices (p/gal)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
	.38	.35	.31	.27	.34	.36	.31	.27	.26	.27	.32	.31	.31
Economic Optimum (B lb/ac)	223	225	230	235	226	224	230	235	236	235	228	230	230

Source: N (CAN 27.5%), Milk – CSO * Estimate

FERTILISER PRACTICES

The overall level of fertiliser use in Irish agriculture is low because the level of intensification in Irish farming is also low. In rational farm planning, fertiliser consumption should be a function of the level of intensity, not *vice-versa*. However, there may be situations in practice where there is an imbalance between fertiliser use and stocking intensity. The general picture of grassland utilisation in relation to fertiliser practices is shown in Table 7 for 1981. As indicated, about 8% of the grassland area was stocked at 1.1 ac/LU or better, while almost 45% of grassland had a stocking rate of 2 ac or more. This, as mentioned earlier, represents a fall in intensity in the aggregate since 1980. With regard to the proportion of total nutrient usage by stocking rate, Table 7 further shows that the highest stocking rate accounted for 23, 14 and 15% of the N,P,K consumption, respectively, although here again the proportion extended on the poorest stocked farms increased over 1980. The average rates of N,P,K consumption respectively were 27, 6 and 13 kg/ac; the corresponding rates on the best stocked farms being 77, 10 and 24, respectively.

TABLE 7
Some Features of Land Use and Fertiliser Practices on Grassland – All Soils

<i>Stocking Rate</i>	<i>1.10</i>	<i>1.10–1.25</i>	<i>1.25–1.50</i>	<i>1.50–1.75</i>	<i>1.75–2.00</i>	<i>2.00+</i>	<i>All</i>
Prop. of Grassland	7.9	7.2	15.7	12.5	12.0	44.7	100
% N	22.5	16.6	24.3	11.7	9.1	15.7	100
% P	13.9	12.6	21.5	13.6	12.7	25.6	100
% K	14.7	12.4	22.5	13.8	12.5	24.2	100
Kg N/ac	77	62	42	25	20	9	27
Kg P/ac	10	10	8	6	6	3	6
Kg K/ac	24	22	19	14	14	7	13

Source: FMS, AFT 1981

The distribution of dairying and mainly drystock systems and the corresponding level of gross output/ac by stocking rate are shown in Table 8. The figures are not too surprising and accord generally with the respective levels of fertiliser. In general, fertiliser may be used too sparingly on heavily stocked farms and too liberally on poorly stocked enterprises, and specific questions could be asked concerning K levels on intensively stocked farms.

TABLE 8
Distribution of Farms and Gross Output by Stocking Rate (ac/LU)

<i>Stocking Rate</i>	<i>1.10</i>	<i>1.10–1.25</i>	<i>1.25–1.50</i>	<i>1.50–1.75</i>	<i>1.75–2.00</i>	<i>2.00+</i>	<i>Total Average</i>
Dairying (% of farms)	11	10	21	17	13	27	100
Gross output (IR£/ac)	423	347	282	228	206	140	252
Drystock (% of farms)	5	4	12	11	12	56	100
Gross output (IR£/ac)	267	201	179	158	129	93	130

Source: FMS, AFT 1981

RETURNS AND INTENSITY

To show the relationship between stocking rate, fertiliser use and gross/net margins, data are presented in Tables 9 and 10 from the Farm Management Survey of 1981. Both examples cited underline the high correlation between fertiliser application and farm performance.

TABLE 9
Relationship between Certain Variables in Dairying

<i>Stocking Rate</i> (ac/LU)	< 1.10	1.10–1.25	1.25–1.50	1.50–1.75	1.75–2.00	2.00+	All
Gross margin (IR£/ac)	323	256	225	182	165	106	185
Net margin (IR£/ac)	225	166	152	123	112	71	125
N/ac (lb)	218	151	113	69	61	36	88

Source: FMS, AFT 1981

In dairying the returns to intensification are clearly and conclusively demonstrated; both gross and net margins were three times greater on the best than the least stocked farms. In 1981 N application was on average about 8% greater than in 1980, but about 14% greater on the heaviest stocked farms.

TABLE 10
Relationship between Certain Variables in Beef Production

<i>Stocking Rate</i> (ac/LU)	< 1.20	1.20–1.50	1.50–2.00	2.00+	All
Gross margin (IR£/ac)	108	81	93	57	76
Net margin (IR£/ac)	37	37	55	33	40
N/ac (lb)	73	59	30	16	33

Source: FMS, AFT 1981

With regard to beef production, the usual remarks apply. Firstly, returns are considerably less, and more erratic than in dairying. Secondly, when the returns to intensification are expressed in net margin terms they are extremely volatile and underline the uncertainty associated with increased stocking in this enterprise. Indeed, while such erratic returns prevail, fertiliser interests will be more concerned with developments in the dairy sector.

In that context it is worth repeating once again the returns and costs to the process of increasing intensity in dairy farming where rational cost control of inputs is exercised and average yields are obtained. With the standards and assumptions used, diminishing returns were not encountered and the exercise seems profitable in the circumstances prevailing in 1983. Higher levels of technical efficiency would enhance the profitability of intensification and demonstrate that increasing output is an inexpensive way of effectively increasing farm size.

TABLE 11
Intensification and Returns in Dairying

<i>Acres/cow</i>	<i>Fertiliser costs</i>	<i>Total specific costs</i>	<i>Revenue</i>	<i>Margin over repayments</i>
		<i>IR£/ac</i>		
3.0	—	120	197	77
1.5	19	259	393	134
1.2	28	328	492	164
0.9	62	462	656	194

CONCLUDING REMARKS

In this paper it has been shown that the price relationship between fertiliser and the major grassland enterprises is little different from a decade ago and fertiliser prices have risen at a slower rate than most other inputs in recent years. The volume of fertiliser consumption has fallen by about 10% since 1979, but this is comprised of a decline of over 20% in P K and an increase of about 4% in N usage. The relatively greater growth in N consumption need not be a cause for alarm as it is consistent with intensification occurring on a relatively small proportion of farms, despite little apparent change in the aggregate.

The fall in fertiliser sales is largely due to the sharp decline in farm incomes and to a lesser extent, to the decline in livestock numbers but present indications suggest that usage may be increasing (Fig. 2). Fertiliser competes with other farm inputs for its share of expenditure. In the circumstances where little development in capital investment will be initiated, the allocation of farm expenditure will thus be concentrated on the purchase of current inputs which are the main instruments in the generation of output.

In conclusion, a brief comment on two matters which have been the subject of controversy in recent times. Firstly, Irish agriculture has benefited little by the facile and misleading analysis of some international consultants, expensively commissioned at the taxpayers expense, who mine existing sources of data and generally add little by way of original analysis or empirical research to the corpus of knowledge. Unfortunately these reports are frequently quoted and misinterpreted, thereby creating friction in society at a time when there was never a more urgent need for national understanding and co-operation to overcome the critical economic and social problems facing the nation.

Finally, with regard to the prospects for the agricultural sector as a whole, a word of caution must be entered concerning the continuing divergence between inflation rates and farm price trends since the inception of EMS and its effect on real farm incomes. A continuation of this development would pose particular difficulties for Irish agriculture and lessen its competitiveness viz-a-viz other Member States in the longer term. Even with relatively favourable production conditions, Irish agriculture experienced the second lowest increase in farm incomes in the Community in 1982. While real farm incomes in some Member States actually increased appreciably over the past four years, the income position in Ireland deteriorated sharply. In these circumstances there will be a need to maintain the current complement of special measures for Ireland as partial compensation for the divergence in inflation and price trends.

FIG. 1

TREND IN FERTILISER USE 1967-1982

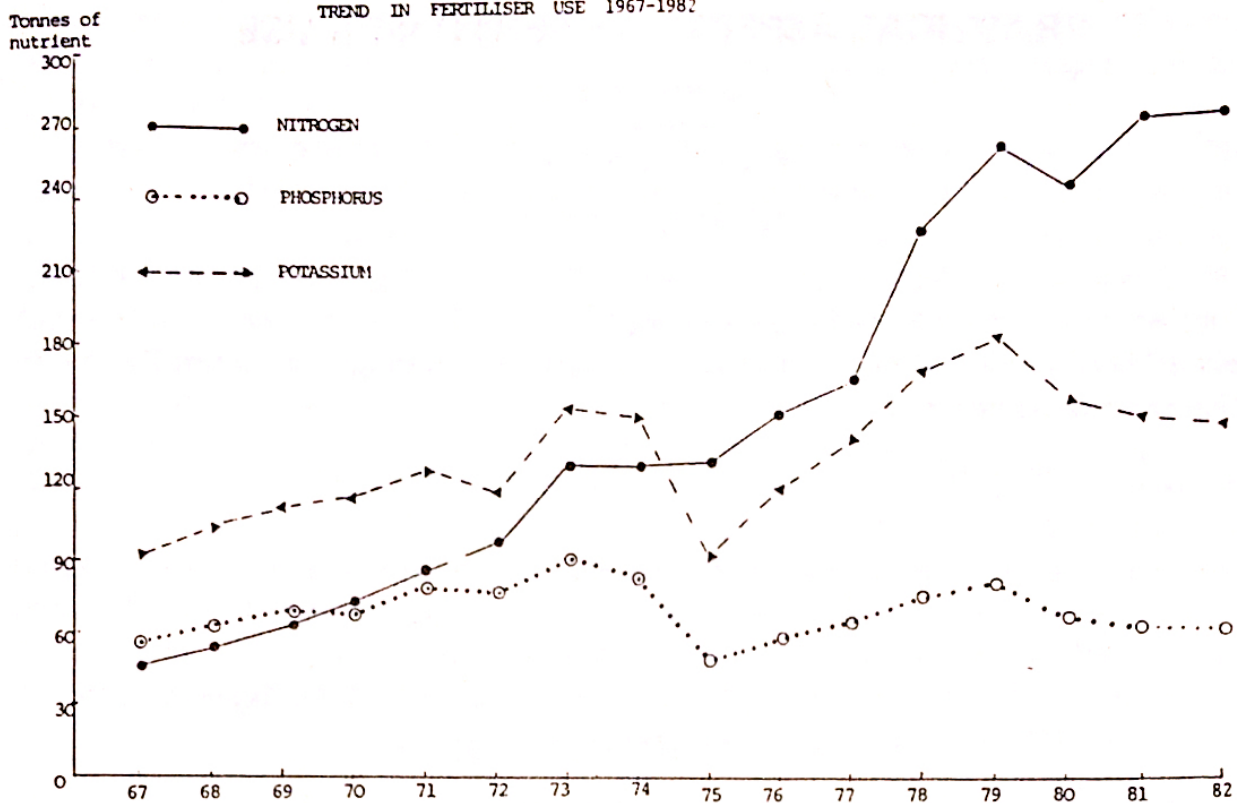


FIG. 2

TRENDS IN CERTAIN INDICES - 1966-1982

