THE FERTILISER ASSOCIATION OF IRELAND

"Dairymaid — An Analysis of Practical Farmer Experience in Profitable Dairying"

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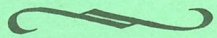

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DAIRYMAID — AN ANALYSIS OF PRACTICAL FARMER EXPERIENCE IN PROFITABLE DAIRYING

Fertiliser production capacity static — potential world fertiliser demand enormous. Any realistic marketing man would put forward a convincing case for higher capacity — in theory. But recent trends would suggest that our man has not succeeded or maybe has not tried at all. Existing plant has tended to be shut down; not new possibilities explored.

Current estimates show how world crop yields need to double by year 2000. This is just to feed the estimated population then of more than 6 billion at today's inadequate standards. FAO, among others, have long promoted higher fertiliser use as the way forward. However, demand, particularly from developing countries, has not been forthcoming.

Why?

There are at least two possibilities—

1. Developing countries really have no money to pay for fertilisers; OR
2. They are not sufficiently aware of how additional resources, directed towards fertiliser purchase, would give possibly the highest return of all.

So, Governments of developing countries and international institutions need more convincing. Whether we agree or not, it seems a long distance away.

Is Ireland dissimilar to this world view?

Certainly not!

The potential food market is, like the global picture, almost limitless. Not from the relatively small home population, but from exports.

Currently, we account for around 2% of EEC agricultural output. Were we to boost output by half, the effects on the overall Community market would almost go unnoticed.

Will it pay?

The producer must have incentive. This was there in an almost blatant fashion until 1978 when annual common EEC price rises were aided by regular Green Pound devaluations, and farmers responded. Between 1973 and 1978, for example, milk output rose by an average 6% per year.

The incentive is still there for producers.

There is hardly any other market where producers have the same guaranteed return as in the EEC.

But is not the Community market for milk tending towards over-supply with consequent damaging effects on the farm gate price? The answer is probably 'yes'. Yet, the potential improvement in profits for most Irish milk producers is considerable.

Why?

Because the opportunity to improve technical and economic efficiency (i.e. result — more milk sold off the farm at reasonable cost) remains enormous. Of more importance, realising this opportunity remains largely within each producer's control.

What are the implications for the fertiliser industry?

Sales, particularly of nitrogenous material, improved continually in the 1973-79 "golden" EEC period. Yet, average nitrogen use on grassland, at the end of the period, was far below optimum. Since then, need I remind you, the situation has become more difficult.

From this, two questions need to be answered:—

1. Are high fertiliser levels justified economically on farms today? AND
2. If so, how can producers be persuaded to adopt this idea for the mutual benefit of themselves, the country's balance of payments and the Irish fertiliser industry.

Fertiliser — How Much?

In a paper read before the Society earlier this year, it was shown that current economic optimum levels of nitrogen use were around 190 and 230 pounds per acre per annum on beef and dairy farms respectively. Such amounts compare to around 40 lbs nitrogen per acre used on dry stock farms and 90 lbs nitrogen used on dairy farms in 1980. (AFT Farm Management Survey).

Conclusion?

Other things being equal, there is absolutely no constraint on higher fertiliser usage on most Irish grassland farms.

Wishes to Reality

Often, in the last decade, attempts have been made to convince producers how higher fertiliser levels and heavier stocking rates would improve their lot.

In retrospect, the evidence, at least on a national level, suggets that such exhortations have had only limited success. For example, between 1972 and 1981, avèrage stocking rates on mainly dairy farms only improved from 2.07 to 1.70 acres per livestock unit. In fact, on mainly dry stock farms, the position disimproved from 2.04 to 2.23 acres per livestock unit in the same period. (Sources: AFT Farm Management Surveys, 1972 and 1981).

Has the time arrived when a greater awareness of the barriers to innovation adoption by producers is necessary? If the reasons why milk producers are reluctant to invest in the fertiliser, grass, milk profit portfolio could be understood better, would not our wishes of higher fertiliser use on farms become more real.

Adoption of Innovation

The adoption process has been described in five stages: (Rogers, 1962 and 1971).

Awareness, Interest, Evaluation, Trial and Adoption

The first four such notions imply that extensive understanding of innovation is necessary. However, it is also important that such understanding should match the individual's conceptual framework. Prospective adopters are likely to view a novel idea within their ever changing current concepts. Hence, the initial failure of an innovation followed by success on reintroduction becomes explicable.

How Traditional is the Notion?

A question running through the minds of all potential innovators. It can safely be assumed that the best chances of adoption lie with the techniques showing most common ground with current concepts.

Some individuals in a population are more innovative than others. This may be because their particular experience allows easier assimilation i.e. they receive more training, attend more conferences and read more relevant literature than other adoptors.

Adoption with incomplete understanding and too few relevant concepts will probably lead to a discontinuance.

A common example here relates to rotational grazing for milk production. Following some local promotion or publicity, many producers have established paddock grazing systems on their own farms. Unfortunately, many did not realise that more flexibility is also necessary on the part of managers in such cases.

Hence, producers have sometimes dismantled paddocks in disillusion because of lack of understanding.

In summary, for a successful adoption of an innovation, good communication is vital: a harmony of ideas between the information, its source and its recipient.

Dairymaid — A Communications Mechanism

The emphasis on improved farm productivity began particularly in the early 1970s immediately prior to EEC partnership. At that time, output per unit area on grass farms in neighbouring countries was considerably higher than here. For example, data from the 1973 Farm Management Survey in Northern Ireland show how average stocking rates were 1.45 acres per livestock unit on their dairy farms and 1.18 acres per livestock unit on their mixed cattle and sheep farms.

Our colleagues in ICI Agricultural Division had employed certain practices to realise such productivity on a certain proportion of Northern Ireland grass farms.

The feeling was that such practices, with possible refinement, were well worth examination for the Irish case.

As now, most grassland fertiliser was then used on dairy farms. Hence, a tool which facilitated adoption of higher fertiliser usage on milk producing holdings seemed appropriate.

Dairymaid had been used as such in some other areas of ICI operation for a number of years. Following some modification, it was introduced here in 1974.

Dairymaid — Aims

The principal aim of Dairymaid is to facilitate increased fertiliser use on Irish dairy farms. In attempting to achieve this, this scheme has a number of subordinate targets.

a) For the fertiliser industry.
   1. Monitor continually factors affecting overall dairy farm profitability.
   2. Justify higher fertiliser use on dairy farms.

b) For Participants—
   1. Demonstrate what influences margins in a particular year.
   2. Show the crucial link between farm management and herd management.
   3. Provide information which can be used to aid adoption by other producers.

Dairymaid — How it works

Participants in Dairymaid are organised in regional groups, each of up to 25 members. There are two schemes — creamery and liquid. Creamery groups are located in the main spring calving areas (full members 1981-150), while the members of liquid groups (full members 1981-75) have been drawn mainly from the Dublin and Cork milk catchment areas.

Strict criteria have been used to select members. Prospective participants must—

1. Show willingness to impartially listen to information given.
2. Be prepared to innovate.
3. Understand how Dairymaid can improve farm profitability.
4. Agree to use an ICI Fertiliser Programme.

Dairymaid — How It Operates

Input

The operation of Dairymaid depends on members sending herd information each month to our computer centre from which results are also directly returned. Because of strict selection, the success of this method has been quite good (average 70% response).

Like any well run business, the producer needs to continually monitor output and major costs within his enterprise. For him, these are milk sales and feed costs. The simple information sheets which he completes are designed to extract these data.

Output

The information printout is back with each Dairymaid member within 3 weeks. This allows timely decision making. His results can be directly compared to those of other group members (coded for anonymity).

For ease of interpretation, Dairymaid output is in three stages—

1. *Rolling Average*

This section continually updates the vital annual herd information. Whole herd and per cow margin over meals, average yield, meal feeding and herd lactation length are shown.

2. *Cumulative — Year to Date*

The month by month accumulation of annual physical and financial results are shown here. Questions which may be prompted by such information include—

How do returns so far compare to the same period last year and why?
Is herd performance to date sufficient to reach targets set at the year start?
If not, can it be improved and how?

Similarly, a herd owner can compare his cumulative herd performance to that of someone with higher rolling averages and discover some reasons why the other herd has better margins.

3. *Monthly*

This section provides detailed herd information for the most recent month. To improve rolling averages, the information here must be examined.

There are three sub-sections—

1. Elements in the margin over meals (£ per cow) calculation.
2. Relationship between milk output, meals fed and feed costs.
3. Monthly targets -- gallons per cow and gallons per day.

Forecast

A forecast of the farm business is also made in conjunction with the herd owner at the start of each year.

This involves predicting milk yield and expected meal feeding and applying projected prices and costs to milk and all feeds. The herd manager can then compare actual performance with forecast output for each month. Participants find this a most useful mechanism to monitor their farm businesses.

Dairymaid in Action

The following is an example of a liquid milk producer who, as in all years, decided in September 1981 to boost margins for the coming year. Herd performance for the year ending August 1981 is shown in Table 1.

TABLE 1
1981 Dairymaid Results — One Producer and Top 25% compared

		Top 25%
Yield — gallons per cow	1,037	1,212
Meals — cwts per cow	19.8	22.0
Nitrogen — units per acre	240	290
Stocking Rate — acres per cow	1.03	0.9
Milk from forage — gallons per acre	530	733
MOFF — £ per acre	415	515

Decision No. 1

In that year, the top 25% of Dairymaid liquid milk producers had returned a margin per acre of £100 more than in this case.

This herd owner decided to feed more meals over the coming winter. The milk/meal price ratio was more favourable and so yields should rise.

The response, shown in Table 2, was disappointing. The principal reason for this poor return was the low feed value silage fed last winter.

TABLE 2
Input/Output Situation — 2 Winters Compared

September - March	*1981*	*1982*
Milk — gallons per cow	625	607
Meals — cwts per cow	17.8	22.0
Margin over meals — £ per cow	318	309

Comparing the March 1982 and March 1981 results gave mixed conclusions.

TABLE 3
Comparing Monthly Results

	March 1981	*March 1982*
Gallons per cow per day	3.68	3.90
Gallons per cow per day from forage	0.97	0.28
Feed costs — pence per gallon	21.9	36.9
Margin over meals — £ per cow	53.04	53.19

While cows had begun to milk better for the most recent March month, margins (in money terms) were static because feed costs had risen considerably.

Decision No. 2

Only one option remained — curtail feed costs and produce more milk.

The herd owner decided that mid-summer grass was the cheapest possible feed. In previous years, he had reduced his 'Pasture Sward' application on paddocks from 2 to 1-1½ bags per acre after May. This year the 2 bags per acre rate was continued after each grazing for most of the season to provide plenty of grass.

TABLE 4
Input/Output Situation — 2 Summers Compared

April - August	*1981*	*1982*
Milk — gallons per cow	414	477
Meals — cwts per cow	2.0	1.8
Margin over meals — £ per cow	231	282

Result

Therefore, comparing the last two years herd results, the target set in September 1981 was well achieved.

TABLE 5
Results of Producer Action — 2 Years Compared

	Year ending August 1981	*Year ending August 1982*	*% Change*
Yield — gallons per cow	1,037	1,084	+4.5
Meal — cwts per cow	19.8	23.8	
Nitrogen — units per acre	240	300	
Stocking Rate — acres per cow	1.03	0.95	
MOFF — £ per acre	415	465	+12%

Fertiliser/Grass

There has been considerable debate on the input/output situation of Irish farming, particularly since the mid 1970s. Some commentators have been perplexed by the rising graph of farm input usage (including fertiliser), while farm output was stagnant or falling.

It has been shown how a good understanding of an innovation together with a clear concept of its application is necessary for adoption. Recognising this, we in ICI have promoted the systems approach to grassland management for a number of years.

The thinking has been that, if innovation adoption gives good results, then its chances of success are better. Likewise, if the operation of the notion is simple.

So came the Two Sward System of grassland management. In this, grazing and silage areas are managed separately—

Benefits

1. Simple management decisions
2. Separate grasses for best results
3. Simple fertiliser programmes
4. Inexpensive to set up .

} All facilitate adoption.

Definite monetary advantages have been shown for people practising the Two Sward System.

TABLE 6
Grassland Systems Compared — Dairymaid 1981

	Two Sward System	*Other Systems*
Milk yield — gallons per cow	923	872
Meals — lbs per gallon	1.4	1.3
Nitrogen — units per acre	280	240
Stocking Rate — acres per cow	1.0	1.1
MOFF — £ per acre	354	314

While herd owners practising the Two Sward System used more inputs, they were well rewarded financially by producing more milk from grass.

Most herd owners joining Dairymaid in the past have practised some form of rotational grazing. Now more than 80% practice the Two Sward System.

Considering that the grazing and silage blocks must be fertilised continually for best results, accepting the need for higher fertiliser use in the system is simplified.

Fertiliser/Milk

The value of fertiliser in growing grass and of grass in producing milk has long been recognised. So it would seem that the fertiliser/milk relationship should be clearly understood. However, it seems that this is not so. Were this accepted more, fertiliser sales for milk production should receive a further boost.

To facilitate such acceptance, analysis of more than 800 herd years within ICI recorded dairy farms suggested the following (Ref. Hawkins & Rose):

One extra kilogram of nitrogen was associated with an extra 9.9 litres of milk and 4.9 litres were associated with the extra nitrogen independently. Taking milk price at 14p per litre and nitrogen at 45p per kilogram:

a) £1 spent on nitrogen gives an extra £3.05 in milk sales.
b) £1 spent on nitrogen gives (independently) an extra £1.52 in milk sales.

An examination of 1981 creamery Dairymaid results showed how an extra £1 spent on fertiliser was associated with an extra £2 in margin over feed and forage costs per acre.

Dairymaid over the years

The ultimate test of any innovation is its results. It is well known that the trend in real farm incomes was generally upwards until 1978, then falling until 1981 with a resumption upwards in 1982. How have Dairymaid results compared to this?

To examine this, a series of gross margin results for the top 25% of producers on creamery Dairymaid has been compared in both nominal and real terms to those of the average creamery producer on Farm Management Survey full time farms in Ireland. The results are shown in Table 7 and Graph 1.

TABLE 7
Real Trends in Margins on Farm Management Survey and Top Dairymaid Dairy Farms

	1975	*1976*	*1977*	*1978*	*1979*	*1980*	*1981*
Nominal Gross Margin per acre. Top 25% Dairymaid	142	260	359	367	408	452	472
Real Gross Margin per acre Top 25% Dairymaid	142	220	268	253	250	234	202
Nominal Gross Margin per acre. Farm Management Survey	59	85	116	162	144	141	174
Real Gross Margin per acre Farm Management Survey	59	72	86	112	88	73	75
Consumer Price Index 1975 = 100	100	118	134	145	163	193	233

The general income trends in both samples over the years are broadly similar. While real income of both groups fell substantially in the 1978/1981 period, that of the top 25% Dairymaid producers fell by just 20% compared to 33% for the other group, despite the higher initial base of the former. At the end of the period, real gross margin per acre of the Dairymaid sample amounted to 270% of the FMS sample, compared to 240% in 1975.

Hence, there is some evidence that milk producers paying more attention to rigorous herd and farm management have come through the 1978/81 difficult pricing period more favourably.

Dairymaid/Fertiliser

Since its establishment in 1974, Dairymaid has succeeded in getting higher fertiliser use adopted on a number of the more technically progressive dairy farms. This is shown in Table 8.

TABLE 8
Influence of Dairymaid on Fertiliser Sales

	1975	*1977*	*1981*
Number of farms	150	200	235
Herd Size	63	68	75
Nitrogen – units per acre	161	222	260
Total sales high nitrogen compounds	46,985	86,820	204,000

Conclusion

It has been shown how there is an enormous market for Irish food. Higher fertiliser use is a key element in the achievement of this goal. Though this message has been broadcast for many years, adoption rate on a national scale has been disappointing. There is some evidence that facilitating adoption of the higher fertiliser use idea has been at least as important as the idea itself.

Total sales of high nitrogen compounds rose from zero tonnes in 1972 to 204,000 tonnes last year. Since most of this is applied on dairy farms, it seems reasonable to suggest that the Dairymaid concept has helped such sales figures along. Similarly, its messages have radiated to those grassland farmers who have adopted better management principles and now apply more nitrogen.

There is still much to be done. If everyone in the fertiliser industry were to help promote the concept of higher fertiliser use to a greater extent, there seems little doubt that the current dismal picture of static capacity and miserable margins would become a thing of the past. Merely dropping fertiliser prices is not the answer.

NOTES

GRAPH 1
Real Trends in Dairy Farm Margins — (Base (1975)