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SPANISH FERTILIZER INDUSTRY: AN ANALYSIS

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INTRODUCTION

On the occasion of the last meeting of the Technical Sub-committee held in Paris in January, Fertiberia was invited to participate -for which we are most grateful to IFA- and accepted the suggestion to present a paper for this celebration; the subject, agreed on later, "**Spanish fertiliser industry: an analysis**".

To speak about the Spanish fertiliser industry is very much, as you will see later, to speak about Fertiberia and may require some explanation about the origin of the company; this is the reason why I have included a reference to the past in the first part of the presentation. The second will be devoted to describe the present status of our industry and in particular of Fertiberia as the leading company. Finally, the third part will consider the key points that from our point of view will mark the future of the industry and what Fertiberia is doing to face it with possibilities of not only surviving in a difficult business but also improving its position.

I want to acknowledge the help received from ANFFE, the Spanish Fertilisers Manufacturers Association, and members of the company who provided me with a lot of valuable information to prepare this presentation.

THE PAST

The Re-Structuring Process: An overview

The fertiliser industry in Western Europe has undergone a great change in the last fifteen years resulting in a capacity reduction and a amalgamation of companies. Spain was not an exception as can be seen in the table below that shows in percentage the capacity reductions, both for Spain and the EU between 1980 and 1993 according to EFMA.

Product	<u>Percent Capacity Change</u>	
	EU	Spain
Ammonia	-21.5	-41.8
AS	-41.7	-40.5
Urea	-19.6	-25.7
AN	-14.8	- 3.4
CAN	+ 5.2	- 0.0
AP	-61.1	- 5.3
NPK's	-39.9	-54.0
PA-wet	-60.1	-10.6

The starting point at the beginning of the 80's may be summarised in the following (and here you can find the main reasons for this process):

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- * A high number of companies:
 - ◆ 3 of large size (ERT, CROS and ENFERSA)
 - ◆ 3 of medium size (NICAS, ASUR and SEFANITRO)
 - ◆ 8 small ones
- * Production of ammonia based on naphtha, i.e., expensive.
- * A great number of old plants.
- * An excess of production capacity, particularly for NPK's.
- * High production costs and low productivity.
- * Poor financial ratios
- * Special market conditions
 - ◆ Market barriers: non-existence of imports
 - ◆ Government regulated prices

And the situation would certainly get worse when the market barriers were suppressed as a result of our joining the EEC (EU) (which happened in 1986). So the need was clear for a re-structuring process and Government and companies agreed on a **Re-structuring Plan** in February 1985. The plan included basically:

- * The decision to reduce the capacity of production by closing plants.
- * Investments necessary for improving the productivity, among them the change from naphtha to natural gas for the production of ammonia and energy optimisation.
- * Measures to improve the financial conditions of the companies.
- * Social measures to cater for the large number of employees that had to be made redundant.
- * Market rationalisation measures.
- * Merger of companies and exchange of assets between companies to get a more balanced product range.

With regards to amalgamation, the major impulse came from the merging of CROS and ERT resulting in the new company ERCROS in 1988: the fertiliser divisions of the two companies resulted in the new FESA (Fertilizantes Españoles S.A.).

In December 1989 FESA took a share of 80% (to which it added the remaining 20% later) in the State-owned ENFERSA after which the new group FESA-ENFERSA controlled also:

- * ASUR (50% FESA, 50% ENFERSA)
- * NICAS (50% FESA, 50% stock)
- * IQZ (100% FESA)

Neither this, nor the measures of the plan were enough to overcome the crisis of the sector. The new group FESA-ENFERSA went through its own re-structuring process which resulted, after more capacity reduction, in the creation of the new FERTIBERIA with the plants remaining in operation in mid 1993. Finally the company was taken over by the present owner -Grupo Villar Mir, a Spanish industrial group- in May 1995.

The magnitude of the change suffered by the fertiliser sector in Spain is best shown in the following transparencies.

A further step towards amalgamation was taken in December last year when FERTIBERIA bought its 88.7% share of SEFANITRO.

THE PRESENT

What was left after this re-structuring process is a fertiliser industry formed by the following companies:

- * **Fertiberia**
- * **Sefanitro (93.93% Fertiberia)**
- * **Inabonos**
- * **S.A. Mirat**
- * **S.A. Carrillo**
- * **Grupo Agrimartin (Fertesa)**

with a total of 14 manufacturing centres of which 9 including Sefanitro are integrated in the **Fertiberia Group**.

Besides these, other 4 companies produce fertiliser-related products:

- * Ammonium sulphate as by-product
 - * Productos Químicos del Mediterráneo -**Proquimed**
 - * **Repsol**
 - * Energías e Industrias Aragonesas -**EIASA**, which transforms ammonia supplied by Fertiberia into ammonium sulphate for the consumption of this company.
- * Potassium sulphate
 - * **Potasas y Derivados**, whose product is commercialised by Fertiberia in Spain.

The map in the transparency shows the location of the factories, the products manufactured and the total capacity for each one.

The production of these companies complemented by imports supply the fertilisers required by the Spanish agriculture. The size and structure of the fertiliser sector both for production and consumption are shown transparencies, for the year 1996 together with the evolution of consumption since 1985.

To end up with this overview of the sector some overall figures may help:

• TURNOVER (Pta, Millions)	145,000
• PRODUCTION (T, Millions)	5.4
• CONSUMPTION BY AGRICULTURE (T, Millions)	5.6
• IMPORTS (T, Millions)	2.9
• EXPORTS (T, Millions)	1.3
• MARKET SHARE OF NATIONAL PRODUCTION (%)	41.6

The contribution of fertilisers to the value of agriculture production is estimated to be 3.3% for 1996.

Fertiberia Position (Spain)

The map shows the location of Fertiberia factories and distribution warehouses together with the total production capacities for each product.

In another transparency you have the contribution of Fertiberia and Sefanitro to the national production both for fertilisers and intermediate products.

Fertiberia position in Spain is clearly that of a leader, showing the high degree of concentration reached over the years and also that Fertiberia is the only Spanish manufacturer with an integrated production.

Fertiberia Position (West Europe)

The following transparencies show the production capacities of the most important West European companies for different products, by nutrients, and total capacity, according to our own estimate.

It can be concluded that Fertiberia is the fifth largest fertilizer company in West Europe and the fourth largest in the EU.

As I said in the introduction, speaking about the Spanish fertiliser industry is very much to speak about Fertiberia; now you have the reasons for that statement and you will understand that I will focus your attention on Fertiberia for the rest of the presentation.

Fertiberia ownership

The structure of Fertiberia ownership is as follows (%):

• Grupo Villar Mir	96.36
• Others	3.64

It may be worth now saying something about the main shareholder of the company:

Grupo Villar Mir

The group is an independent industrial family group not linked to financial institutions and, besides Fertiberia, controls:

- One of the most important civil engineering, building and public works contractors.
- The first Spanish ferro-alloy company.
- The first independent hydroelectric producer in Spain.

The Group's management policy is based on:

- Profitability
- Respect to each company's entity.
- Quality and service to clients.
- Permanent improvement of productivity and costs.
- Participative management by objectives.
- Highly motivated management teams.
- Wide delegation.
- Maximum self - financing.
- Strict job criteria: honesty and austerity.

Our mission

Following these guidelines Fertiberia aims at fulfilling its mission:

**To adequately satisfy the needs of our clients
being the manufacturer and supplier more competitive
in cost, quality and service.**

**To be the best company in the sector towards
our clients, employees, suppliers, shareholders and
the communities within which we work.**

Fertiberia relevant figures

The transparency shows the main economic figures of the company since its beginning in 1994.

For 1997 the Fertiberia Group expects to reach:

- NET SALES (Pta, Millions) 85,000

The investment program for the years 1995 through 1997 amounts to 9500 Million Pta.

Participating Companies

Sefanitro

At the end of 1996 Fertiberia acquired 88.71% of the capital of this company, percentage which was later increased to 93.93%. Sefanitro will however keep its own product mark and legal entity. Nevertheless the company will become completely integrated in the Fertiberia Group management and operating systems particularly in the industrial and commercial policies and the supply of raw materials (ammonia) at lower prices than before.

The more relevant figures of the company are:

Production capacity (T/year)

Nitric acid	180,000
CAN	300,000
ASN	140,000

Productions (T, 1996)

Nitric acid	181,956
CAN/ASN	359,914

Sales (Pta, Millions,1996) 6,719

Employees 159

Incro

An engineering company owned 50/50 by **Fertiberia** and **Intecsa-Uhde**, mainly devoted to the development and transfer of basic technology and know-how, detail engineering supervision and plant's start-up in the fertiliser field, particularly in DAP and NPK.

Fertiberia technology, licensed through Incro, has been successfully proven in many industrial plants world wide, i.e., Japan USA, United Kingdom, Taiwan, Philippines, Saudi Arabia, Korea, etc.

Incro is presently involved in the following projects:

Plant revamps:

- 4 DAP/NPK plants in Korea
- 1 DAP/NPK plant in India
- 2 DPP/NPK and 1 AN plants in Colombia

New plants:

- 1 DAP plant in Pakistan
- 1 NPK plant in Indonesia
- 1 AN explosive grade plant in China
- 1 NPK plant in Korea

Development of new technologies:

- Environmental treatments to comply with new regulation requirements for effluents
- An additive to increase the porosity of explosive ammonium nitrate (in cooperation with the Japanese company Sinor-Kao).
- A new process for ammonium sulphate granulation from ammonium sulphate liquid by-product.

Fertiberia Products

The transparencies show the products distributed by Fertiberia. With the exception of potassium sulphate -produced by Potasas y Derivados- all the products are manufactured by Fertiberia.

As you can see our products cover a wide range of types and grades to meet the needs of our farmers.

Fertiberia Plants

The transparencies show for each product, the capacities and technologies of Fertiberia and Sefanitro plants.

THE FUTURE

The fertiliser business is a difficult one and as in many other industrial sectors only those companies prepared for the future will survive.

It is out of the question that the future will be strongly influenced by a few but very important aspects, which mark the behaviour of a company with regards to the consumers of its products, the community within which it works and the competitors. Hence our commitments with

The Quality
The Clients
The Environment
Competitiveness

What Fertiberia is doing to get a high standard in all these aspects will be the main subject of the third part of this presentation together with a reference to our new projects.

The Quality

All the quality aspects of our manufacturing processes are covered by a Quality Assurance System developed throughout 1996 and which we expect to be certified by the Spanish Normalisation Association (AENOR) according to ISO 9002 within 1997.

The system, which covers all the factories and products, required a great effort from all levels in the organisation: besides the members of the quality teams which developed it, more than 500 employees received internal and external training on quality related subjects.

The Clients

Supplying a good product to the customers is only part of what they expect: added services are more important every day.

Fertiberia makes fertilisation recommendations through its Agronomic Department after analysing soil and vegetables' samples sent by farmers, in the Agronomic Laboratory located at the Huelva Factory which we will visit tomorrow. The laboratory is prepared to analyse 12000 samples per year equivalent to more than 150000 analysis.

Dealer (through whom farmers contact the company), Laboratory and Agro Department are interconnected by a telecommunication service to speed up the process.

Other services provided are:

- Assistance to solve farmers specific problems.
- Demonstrations on the use of products.
- Extension talks on agronomic techniques.
- The publication of a Bulletin sent to more than 10000 farmers.

The Environment

Quality means not only producing good things but also producing them well, which includes the respect for the environment. This is a main concern of Fertiberia but as opposite to past times when companies limited their actions to respond to the pressure of the communities or the authorities, we are pro-active and try to go beyond what may be required in the future.

Some of our achievements and projects are worth mentioning:

- All Fertiberia nitric acid plants are already prepared to work at 200 ppm NO_x, well below the 400 ppm recommended by EFMA's BATs for existing plants. SCR DeNO_x units have been installed in all our plants but one: The Sagunto plant whose absorption tower designed for 200 ppm. Two more units will be contracted in 1997 and 1998 for the Sefanitro plants.

The two last units installed were for the Cartagena factory where they had to replace two non-selective DeNO_x units based on propane. Such replacement required a detailed study of the performance of the plants under the future conditions and particularly of the heat and power balance. The Technical Department of Madrid developed computer simulation programs as well as the basic design of the modification of the heat exchanger trains. The first of these units is in operation since June.

- Washing columns for process steam from AN reaction have also been designed by the Technical Department for three AN units.

In the most recent case (Cartagena) a complete change of the reaction and preconcentration section of the plant was designed by the Technical Department to replace the original Fisons reactor. The plant was started up successfully in June 1997.

- Process condensates from ammonium nitrate plants are being recovered as process water in the absorption towers of all Fertiberia nitric acid plants. The most recent ones are Sevilla (1995) and Cartagena (1997). The Sefanitro plant will also use these condensates after the modification already planned and to be developed by the Technical Department.
- Improvements to reduce gaseous emissions, effluent water and the level of their contaminants were also implemented:
 - DAP plant in Huelva as part of its revamp (1995) designed by **Incro**.
 - The NPK plant in Huelva (1995, also with **Incro** design).
 - The NPK plant and the granulation trains in Avilés (1996/97).
 - The SSP and NPK plants and the AN/CAN granulation units in Sevilla (1996/97).
In the last two cases with in-plant basic design.
 - The NPK/AN/CAN granulation units in Cartagena (1997) with **Incro** basic design.

In all cases using recirculation washing and purge recycle to process or other uses like solutions manufacture.

- A urea condensate hydrolysis and stripping unit is just now under erection at the Palos factory with Toyo basic design. A similar unit, designed by Snamprogetti, is in operation at the Puertollano factory since 1990.
- Ammonia condensate stripping units are installed in the ammonia plants of Palos (1988) and Puertollano (1991), the last one developed by the Technical Department.
- The most important project in this field is the construction of a gypsum pile at the Huelva factory with water recycle. The pile will be in operation by the end of this year.
- Finally I want to mention a process developed years ago at the Huelva plant for the treatment of acid waters from sulphuric acid units; the process has been patented by Fertiberia and a unit based on it is in operation at the plant since 1992.

All this means investing a large amount of money in our plants, which for the years 1995/96/97 will be over 2800 MM Pta. But the concern for the environment is not only a question of laws, regulations and money. To Fertiberia is something its employees must have permanently in mind, incorporated to their acts and to their way of thinking. For this reason Fertiberia organises every year in all the factories an **Environmental Week** with the purpose of:

- Making employees aware of environmental related problems.
- Teaching them techniques and operating practices.
- Allowing people who live in the community to know what we are doing.

Fertiberia concern for the environment is also shown by the permanent follow up of the control parameters in a monthly report prepared by each factory in which these values are compared with the applicable limits set up by the regulations and shortly with EFTA BAT recommended limits.

Finally the company is involved in the preparation of an Environment Management System.

Competitiveness

Last but not least, besides producing good products and producing them well, you must produce them in the cheapest possible way. Reducing costs is a permanent goal at all levels in our company. Some examples of what Fertiberia is doing in this field follow:

- Bottlenecking production units: Nitric acid and AN/CAN plants in Sagunto (1996).
- Start up of idle plants:
 - Nitric acid in Puertollano (1996).
 - Urea in Huelva (1996).
- Plant Revamps and capacity increase:
 - DAP plant in Huelva (1995).
 - Phosphoric acid plants in Huelva (1997/1998).
- Energy saving projects:
 - Nitric acid and AN liquor plants in Cartagena (1997).
 - Refrigeration unit for CAN/NPK granulation, using process steam from the AN liquor plant as the hot fluid in a Lithium Bromide Absorption System; this unit is in operation since June this year at the Cartagena factory. This project deserved financial support from the EU through the program LIFE.
 - Use of process steam instead of live steam for heating purposes (process, storage conditioning) at the AN/CAN plant in Avilés allowing the production of electricity in a turbogenerator after modifying the neutralisation and concentration sections of the plant. The basic design of this project was also developed by the Technical Department in Madrid and checked by UHDE, original plant licensor. The modification will be in operation by the end of this year.
 - Expansion of natural gas in a turbine with electricity generation. Start up is foreseen in April 1998 at the ammonia plant in Puertollano.
 - Expansion of natural gas to cool the purge gas from the synthesis loop, replacing a cooling unit based on freon, in operation in Palos since September 1996.

All the examples given so far have been taken from the technical field. But Fertiberia efforts to reduce costs are not limited to this field.

A great reduction in cost was achieved by the replacement of the old computer system by a new modern one based on small but powerful servers installed at the Central Offices and in all the factories. In parallel with this a new information system is being developed by a company of the Grupo Villar Mir -Espacio Information Technology- in cooperation with Fertiberia. The new system, partly implemented through 1996, will allow an optimisation of resources and produce in time and more reliable information.

Finally, the company developed a new Maintenance Management System based on Total Productive Maintenance Techniques, already implemented in all the factories allowing a more flexible, economic and reliable maintenance.

New Projects

Before ending this presentation, I want to mention some other projects Fertiberia is considering or initiating.

In the energy field, two cogeneration projects are being evaluated for Huelva and Puertollano.

Fertiberia wants to satisfy the ever-growing demand for soluble solid fertilisers and liquid fertilisers required by the techniques of fertirrigation, which have reached a high degree of expansion in Spain. Consequently, the company is planning an important development of this type of product for the coming years.

CONCLUSION

After all I have said I do not think it is too optimistic to conclude that Fertiberia, and consequently the Spanish Fertiliser Industry, is firmly established on sound basis, both technically and financially, with well prepared people and thus ready to face the challenges of the future.

Some uncertainties still threaten our future, mainly from the Common Agricultural Policy and the Market Organisation of the EU. Besides that our industry has to face the disadvantage of the foreign supply of raw materials (gas, phosphate rock and ammonia). But other factors are favourable and allow us to hope that the fertiliser demand will, at the least, grow moderately: the modernisation of irrigation and its extension, the lower rates of fertiliser application in comparison with the other European countries (particularly for N and K₂O) and consequently the smaller influence on our agriculture of the restrictions imposed by the EU regulations to the use of nitrates.

Of particular importance will be the supply of special products, completely soluble, of high concentration - liquids and solids - to meet the growing demand of fertirrigation and for which we are preparing ourselves.

We feel that we can face the future with optimism.

Thank you very much for your attention and enjoy the rest of the celebration.