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FINAL MISSION REPORT

Name: Andriska, Viktor Chemical Engineer, expert

Date of Mission: 11-14th March, 1986

Aim of the Mission: Collecting data on multinational Chemical companies, for a world-wide study on plant protection agents, for UNIDO.

Mission Programme: 11th March, 1986: flight to London
12th March, discussions in Fernhurst
13th March, discussions in Fernhurst
14th March, flight to Budapest.

Detailed Report:

Institutions and persons visited:

ICI (Imperial Chemical Industries, PLC), Fernhurst.

Discussion partners: Mr. Roger E. Hart, Country Manager -
East Europe

Mr. David Smith, Intern.Aid Agencies,
Relation Manager

Dr. P.Slade, Product Stewardship Manager

Mr. M.J.Whitaker, Public Affairs Manager

Mr. R.A.Woods, Regional Manager - Americas

Mr. Michael F.P. Muldoon, Africa Area
Manager

Synopsis

During the discussions, all partners answered all my questions very readily, so I received all important data. Due to the

short period, the items 1. and 3. of my programme were answered only in gross.

List of Documents received:

ICI Product List
ICI Production Statistics
Product description

Introduction

Short description of the holding

ICI (Imperial Chemical Industries PLC) is one of the biggest chemical companies in the world. Its production profile includes all branches of the chemical industry, from manufacturing inorganic basic materials to the pharmaceutical industry. The site and main technological basis of the company are in the United Kingdom where it has 9 important producing factories; above this it manufactures products in subsidiary companies in 40 countries; his development and marketing organisations are existing in 60 countries. 73 per cent of its chemical production (1984) are sold abroad.

With 11,485 million dollars turnover in 1984, ICI occupied the fifth place among the biggest chemical companies. Agricultural chemicals (fertilizers and plant protecting agents) amounted to 16 per cent of the total turnover (1,800 m£). Pesticides shared 6 per cent (740 million £).

1. Manufacture of plant protecting agents

The division of ICI Controlling the manufacture and sale of plant protecting agents is the Plant Protection Division (PPD, Fernhurst Haslemere, Surrey, England). This division performs and/or controls the research, development, production and marketing activities for plant protecting agents, for the holding.

The Plant Protection Division ranks among the pesticide companies showing the most dynamic development throughout the world.

Its sales increased, within 15 years, to twentyfivefold of the original amount.

Development is indicated by the following figures:

Year	Turnover (million \$)
1970	30
1981	72
1972	120
1973	150
1974	200
1975	280
1976	295
1977	360
1978	510
1979	550
1980	610
1981	630
1982	690
1983	710
1984	740

From the turnover in 1984, the most important types accounted for the following shares: 34 per cent for dipyrityls; 17 per cent for pyrethroide; 7 per cent for fluazifop-methyl (Fucilade); 18 per cent for other pesticides and 24 per cent for distribution products.

2. List of Products

2.1 Herbicides

Cramoxone	- quaternary dipyridyl
Reglone	- quaternary dipyridyl
Fusilade	- fluazifop-methyl
Flex	- fomesafen

2.2 Fungicides

Nimrod	- bupyrimate
Milgo	- etirimol
Milcurb	- dimetirimol
Milstem	- etirimol
Impact	- flutriafol
Vigil(Anvil)	- hexaconazol

2.3 Insecticides

Ambush	- permethrin
Cymbush	- cipermethrin
Actellic	- pyrimiphos-methyl
Primicid	- pyrimiphos-ethyl
Pirimor	- pyrimicarb
Karate	- PP 321 - (now pyrethroid)

2.4 Rhodenticides

Talon	- brodifacoum
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2.5 Regulators

Culter	- paclobutrazole
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3. Export activities

From the turnover of 740 million dollars in 1984, the sales in the U.K. meant only 56 m \$ (=7.56 per cent). The rest of roughly 92 per cent was realized in exports.

The turnover in 1984 had an increase of 32 per cent by value in comparison to the former year.

The most important export region is Western Europe. The value of exports to this region was 220 million USD i.e., 30 per cent of the total sales figure. About one quarter of the full export to Western Europe was realized through the subsidiary ICI-Sopra in France. The most significant products sold by Sopra were Gramoxone, Fusilade, Vigil and Impact, beside smaller amounts of plant protection agents from companies other than ICI. Italian sales are in the hand of the ICI-subsiary Solplant, sales for 1984 amounting to 34 million USD. The commercial company for Spain, the Zeltia Agraria reached a turnover of 20 million USD in 1984.

The French, Italian, Spanish and FRG market accounted for 70 per cent of the Western European exports. The rest was shared between the Scandinavian and Benelux countries.

The last 10 years brought a spectacular development for the holding in North America. In 1974, the exports to this continent had a value of 1 million USD essentially consisting only of seed dressing agents. Sales in 1984 showed a value of more than 100 million USD. Through this hundredfold increase the North American market reached 20 per cent of total sales.

On the American continent, 35 associate companies and marketing organisations are involved in the sale, manufacturing and formulation of ICI plant protecting agents. The most important among them are the ICI Americas Inc. (USA), the Chipman Inc. (Canada) and the C.I.L. Inc. (Canada).

Main products exported to the North American continent are the dipyridyls, synthetic pyrethroids and Fusilade.

The value of exports to Latin-America represented as much as 25 million USD, i.e., 7 per cent of total exports in 1984. 50 per cent of this was directed to Brasil and Argentine.

The Far East region takes up 19 per cent of the exports: 140 million USD by value. The main export products going to Asustralia are Gramoxone, synthtical pyrethroids and Fusilade, totaling to 32 million USD. In several Far Eastern countries, ICI products are manufactured also through "joint venture" operations. Thus a Japanese company (Teijin) produces paraquat. Smilar arregements exist also in Malaysia and Thailand.

In Eastern Europe, the main ICI products sold are Paraquat and Diquat, in a value of 35 million USD.

African exports amount to 6 per cent, most of it are sold through the company Bayer - South Africa into the South African Republic.

On the African continents, 34 selling organisations are involved in the distribution of ICI plant protecting agents.

In summary, the number of selling companies serving the world-wide manufacturing and export activities of ICI in some major regions of the world is the following.

Western Europe	23
Americas	33
Far East	20
Eastern Europe, Middle East, Africa	59

4. Development

In 1984, the Plant Protection Division spent 7 per cent of the total turnover (i.e., 52 million USD) on research and

development. With respect to the heavy competition and the tasks connected with the large number of new products being in the final stages of development, it was decided to increase this ratio from 7 per cent to nearly its double till the year 2000. Thus, according to the plans - considering an annual increase of 10 per cent in sales - a total of 2.5 billion (10^9) USD, will be spent on research and development until the millenary.

As a first step, the existing main research basis - the institute at Jealott's Hill - will be enlarged to nearly its double with an investment of 25 million \$, the staff being increased by 200 scientific researchers. In Jealott's Hill, actually more than 300 chemists and biologists are employed in synthesis, screening and evaluation activities. Further research centres are working in Goldsboro (North Carolina) and Ascot Vale (Australia).

A number of field experimental stations are operated by ICI in all climatic regions throughout the world. These are: in the USA - Champaign, Vicksburg and Visalia; in Brasil - Campinas, in Australia - Claydon and D'Aguilac; in France - Toulouse; in Malaysia - Melaka, and in the Philipines - Nueva Ecija.

During the last decade, the company brought in the average every year a new product to the market, through R+D activities; not all of them coming, however, from the ICI laboratories.

As for the actual situation, this number will be doubled and for the next years, every year two products will be introduced. These important R+D efforts are required, since in the near future, patent protection for the dipyriddyls will terminate

and therefore, the extraprofit coming from these herbicides will be lost, due to the competition to be expected.

Actually, 3000 - 4000 new molecules are being synthesized in the research centre of Jealott's Hill. About 7-8000 new compounds are bought from other institutions for biological screening and further investigation if a promising biological action is established. According to initiated development, the number of compounds synthesized in their own laboratories will increase to 6-8000 after the year 1987.

A significant development is planned in the environment protection and toxicological research, since the number and hereby the costs of investigations are heavily increasing, due to the ever more severe registration procedures.

Nowadays, the development costs for a new agent reaches 30 to 40 million pound sterling, the tests and trials required for registration accounting for nearly 40 per cent of this sum.

5. Developing countries and the ICI

The first consideration is that ICI a profit oriented multinational holding. Thus, it has not got the task to support the developing countries and has no financial funds for this purpose. However, it was noted that the Plant Protection Division produces more profits than the plastics and petrochemical divisions which make 25 per cent of the total production value, in spite of the fact that pesticides share only 6 per cent from the turnover.

From the abovesaid, it follows that the further development of pesticide manufacturing and trade gets extraordinarily strong accents. The outstanding results achieved until now can be attributed to several causes. A very important role is played by the new products with excellent effects, by their uniform and fully reliable quality and, of course, by the manufacturing and formulating activities spread over the world, by the experimental field stations and the advisory and service activities offered to the end users.

In regions of important applications, one of the main features of ICI's pesticide development strategy is its participation in the national industry of the countries in question through acquisition of plants, establishing grass roots plants and co-operation ventures. This means, as a matter of fact, also an advantage to the developing countries, by assistance given to industrial production and hereby to economical development by decreasing unemployment and by modernization as well as improving agricultural production. The following survey illustrates the ICI companies per regions.

Latin America

There are 18 productive and/or distributing bases in 7 countries: Argentine, Brasil, Columbia, Mexico, Nicaragua, Peru and Uruguay. Among them, there exists plant protecting chemical production in Brasil (ICI Brasil SA), Mexico (ICI de Mexico SA, Canemex SA), Nicaragua (ICI de Centroamerica SA).

Africa_

There are 21 manufacturing and/or distribution bases in 11 countries of South-East-, South- and West-Africa: pesticides production is being performed in Ghana, Malawi, Kenya, South-Africa, Tanzania, Uganda Zambia and Zimbabwe.

India-Bangladesh-Pakistan-Shri-Lanka_

On the Indian subcontinent, 15 manufacturing and/or distribution bases are operating. Pesticides are produced in Calcutta (Alkali and Chemical Corp. of India Ltd., with 51% shares of ICI), in Madras (same company) and Shri-Lanka (Colombo, Chem. Industries Ltd.).

Near_East_

There are no manufacturing activities by ICI in 11 countries of the Near East region (Algeria, Dubai, Egypt, Iran, Iraq, Jordania, Kuwait, Saudi Arabia, Sudan Syria, Turkey); only "liaison offices" serve the distribution of the full product range.

Far East_

In 7 states belonging to this region (Hong Kong, Indonesia, Japan, Malaysia, Philippines, Singapore, Thailand) there are 18 ICI subsidiaries and commercial offices, resp., 6 of which are manufacturing pesticides: In Indonesia in Jakarta (PT ICI Pesticide Indonesia), in Japan with the site in Tokyo (Teijin Agrochemicals Ltd. and (ICI Japan Ltd.), in Malaysia in Kuala Lumpur (ICI Malaysia Sdn Berhad and Chemical Company of Malaysia Berhad), Thailand - in Bangkok (ICI Asiatic Agriculture Ltd.).

Global aspects

The number of ICI formulating plants amounts to 23. Beside the main plant in England (Yalding), there are 5 in Europe, 3 in North America, 3 in Latin America, 4 in Africa, 1 in Australia, 1 in New Zealand and 5 in the Far East.

Important development successes have been achieved by the Plant Protection Division also in the domain of agricultural machinery. The introduction of Gramoxone allowed direct sowing for which machinery lines have been conceived. The "Electrodyn" spraying equipment by which spraying could be revolutionized, mainly on small parcels, since it works without using any water and the protection can be achieved by spraying out 0.5 - 1 litre of agent per hectare, too, were developed by the mechanical research institute in Fernhurst.

Finally, although the company has not been performing his extensive development of pesticides with the primary aim of assisting the developing countries, it effectively helps these countries by disseminating and demonstrating the materials for economic and advanced plant growing and grain production and, last but not least, by training.

6. Questions of registration

According to informations received, the developing countries show an extremely diversified picture regarding to registration of plant protecting chemicals.

The more developed and bigger countries (such as Brasil, India and China) have procedures of registration similar

to those in Hungary, i.e., full documentation and field trials are prescribed. Registration investigations are, as already mentioned, very expensive, thus they bring profits to the exporting companies only in case of big utilization.

A major part of developing countries consuming increased amounts of pesticides (say in Latin America, Africa) has neither registration procedures nor any controlling organizations. In these countries, the importer companies sell their imported plant protecting agents - like the other chemicals - without governmental prescriptions or control. In countries where the big multinational companies (Bayer, ICI etc.) have their own offices and service network, the craftsmanlike application of their own agents is safeguarded, although the examination of agent remainders, the disposal of outdated chemicals and used containers the festing of environmental impacts etc. are not solved, in lack of suitable organisations.

In most developing countries missing sufficient food the whole of these problems is absolutely unsolved. Any solution can be accomplished but with important assistance from abroad.

Budapest, 24th Marc 1986.

Andriska Viktor m.p.
expert

FINAL MISSION REPORT

Name: Kovács, Ferenc, Technical Manager - Chinoin.

Date of Mission: 21-24th February, 1986

Aim of the Mission: Collecting data on multi-national
Chemical companies for a world-wide
study on plant protecting agents,
for the UNIDO.

Mission Programme: Vienna - UNIDO 21-22nd February, 1986
Kemira Oy-Helsinki 24-25th February, 1986
Union Carbide-
-Geneva 26-27th February, 1986

Detailed Report:

Institutions and persons visited:

UNIDO Vienna: Mr. Pogány, János and Mr. Honti, György
Kemira Oy, Helsinki: Mr. Juhani Uoti, Export Manager
Union Carbide, Geneva: Dr. J.M. Cairney, Vice President,
Agricult. Prod.

Synopsis

From the visits foreseen in the programme, only the above
discussions could be held since the companies Bayer, Ciba
and Hoechst cancelled the dates, due to sickness.
Nevertheless, the mission was, in my opinion, successful
since all expected information could be received from
companies visited. Hereby, I wish to express my gratitude
to UNIDO-VEGYTERV-TESCO for the organizing work done.

List of Documents

1. Query sheet filled in By Kemira Oy.
2. Kemira Oy general Information
3. Query sheet filled in by UC
4. UC Annual Report for 1984.

1. UNIDO - VIENNA (AUSTRIA)

21-22th February, 1986.

Discussion partners: Pogány, János and Honti, György.

This discussion was essentially an extension of the preparatory discussion held in Budapest at VEGYTERV on 18th February, 1986. The partners gave a detailed picture of the interesting and manifold relations between UNIDO and the multi-national companies, of the influence of these companies on the developing countries, further of the very delicate and important question: which interactions are possible between the marketing ideas of the big multi-national companies and the operations assisted by UNIDO. Special accents were given to the circumstance that market interests shown by multi-national companies may form a valuable part of the global study on pesticides especially if they are combined with technical and/or organizational assistance granted to developing countries. On the other side, the study and the UNIDO activities could be perturbing for some companies, even without wishing to do so, in case UNIDO is not informed about the notions of a given company.

The above aspects justify the questions put in the query sheet prepared by VEGYTERV.

2. KEMIRA OY - HELSINKI (FINLAND)

24-25th February, 1986.

Discussion partner: Mr. Juhani Uoti, Pesticide Export Manager.

The company has been founded in 1920. Its annual turnover amounts to 4.5-5 milliard Finnish marks (800-900 million dollars).

The principal products are the fertilizers, participating in the sales with 50-60 per cent. Further products: paints (17 per cent), titanium dioxide (11 per cent) textile yarn, filters, explosives and safety equipment, chemicals. The firm has subsidiary companies in England for paint manufacturing and in USA for titanium dioxide production, the latter ranking second in the world, after DuPont, in producing titanium dioxide.

The production of plant protection agents started only in recent years.

They have only two products:

- KEMIFAM (post-emergent herbicide for sugar beets, the active agent being Phenmediphan)
and
- KEMIKAR (grain dressing chemical, the active agent being Carboxino).

70-80 per cent of their plant protecting agents are exported to the Soviet Union, the rest mainly to European countries which were not detailed. The domestic consumption was said to be unimportant (abt. 5 per cent). No more information was given concerning manufacturing range and market prices.

On the other side, in connection with development ideas, it was indicated that a big investment had been started in their plant in Finland (Kokkola), allowing an increased production of the above two products, exclusively for Soviet exports, according to recent plans.

No marketing network is established in the developing countries these do not figure in their marketing strategies.

The welcome was extremely warm. The query sheet of VEGYTERV was handed over, entirely filled-in. Above that, information on the company in general and showing details for the year 1984 was passed on.

These informatory prints are filed with VEGYTERV.

3. UNION CARBIDE- GENEVA (SWITZERLAND)

26-27th February, 1986.

Discussion partner: Dr. J.M.Cairney, Vice President, Agricultural Products.

Welcome and discussion atmosphere were collegial, the market shares, manufacturing capacities and prices are, however, treated by the company as confidential. On the other side, the following information was readily handed over.

According to literature data, verified in the discussion, in 1984 UC realized a sales value of 9.5 billion (10^9) USD, including plant protecting agents valued about 370 million USD. From pesticide sales, the Far East and South American regions share approx 40-50 million dollars each.

The company follows a very active market policy. With main markets remaining in the USA, they wish to enlarge their sales also in the developing countries.

It was told that their market positions in Sudan and Ethiopia are important and they want to increase their activities in these countries as well as in Central and Latin America.

They do not intend to establish new formulating plants, an exception might be the Soviet Union. The company has a very active market policy (sometimes called aggressive in the literature) and this not only concerning the sales but in case the customer in question is not sufficiently expert, also consultation and training is given as for the storage, warehousing, weighing-out, distribution and application, further for equipment connected to these operations. All this is performed with very favourable conditions, including the training of the expert staff, supposed the plant protection agents are purchased from Union Carbide.

Finally it was said that, in case of such demand, they are prepared to establish a plant for manufacturing Etephon (growth regulator) agent, fully owned by UC.

Upon my question, it was added that the causes for this were not connected with labour, health or environment protection.

Finally, Mr. Cairney handed over the VEGYTERV query sheet filled-in, as well as the Annual Report of UC for the year 1984. These documents are filed with VEGYTERV.