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Meeting for the Identification and Development of Fertilizer and Pesticide Industries in the Developing Countries Served by ECE.

Bucharest, Romania, 10-14 July 1972

REPORT OF THE MEETING FOR THE IDENTIFICATION AND DEVELOPMENT OF FERTILIZER AND PESTICIDE INDUSTRIES IN THE DEVELOPING COUNTRIES SERVED BY ECE

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Contents

I. ORGANIZATION OF THE MEETING

The technical and economic problems of the fertilizer and pesticide industries in the developing countries of Europe were discussed at a meeting held at Bucharest, Romania, from 10 to 14 July 1972. Organized by the United Nations Industrial Development Organization (UNIDO) in co-operation with the Economic Commission for Europe (ECE) and the Government of Romania, the Meeting was held under the auspices of the Joint UNIDO/Romania Centre for Co-operation in the Field of Chemical and Petrochemical Industries for the Developing Countries.

The main objectives of the Meeting were:

To identify problems related to the production and use of fertilizers and pesticides in the developing countries served by ECE;

To provide guidelines for the future work programme of UNIDO in this field.

Additional objectives were:

To promote co-operation and encourage joint projects between the the developing countries and between these and developed countries in the production of fertilizers and pesticides;

To provide a forum for exchange of experiences in the manufacture of fertilizers and pesticides, particularly as related to problems of production technology, quality control, personnel training and environmental pollution.

C. Keleti acted as Officer-in-Charge of the Meeting and K. Szabo as Technical Secretary. From the Romanian side of the Joint Centre and of the organising committee, A. Lungu was the counterpart officer, V. Ionita was the liaison officer and M. Anghelescu was the administrative officer.

C. Hera and A. Constantinescu of Romania were elected Chairman and Vice Chairman respectively, and P. Markou of Cyprus and E. C. Little of the Food and Agriculture Organization (FAO) were elected Rapporteurs for the fertilizer and pesticide sections, respectively.

The inaugural address was given by the Romanian Deputy Minister for the Chemical Industry, Nicolae Ionescu. C. Keleti read a message from the Executive Director of UNIDO, I. H. Abdel-Rahman; A. Rotival, Resident Representative of the United Nations Development Programme (UNDP) in Romania,

II. FIELD TRIPS

A. Visit to the Craiova Chemical Complex

The host country, Romania, arranged a trip to Craiova to visit the complex of chemical plants there.

The group of 31 participants was received by O. Popa, technical director of the complex. After a brief description of the plants to be visited, Mr. Popa invited questions from the participants.

The plants were then inspected; they included:

A 600-ton-per-day ammonia plant based on technology developed by the State Institute for the Nitrogen Industry (GIAP) (USSR), which uses oxygen reforming at atmospheric pressure, and a 925-tons-per-day ammonia plant, using the Imperial Chemical Industries (ICI) reforming process, delivered by Sybetra - (Belgium) as general contractor and licensed by Humphreys and Glasgow (England). A project to install computer control in this plant is being studied. The raw material for both plants is natural gas.

A urea plant using CO_2 and NH_4 from an ammonia plant as raw materials. This plant was also delivered by Sybetra and is based on the Stamicarbon technology, but with licence and engineering from Evence Coppee-Rust of Belgium. The plant is producing urea with a biuret content of 0.7 to 0.9 per cent.

A nitric acid plant with a capacity of 750 tons per day (as 100% HNO_3) also supplied by Sybetra, using Grande Paroisse technology with medium-pressure conversion and high-pressure absorption (Escher-Wyss compressor). The concentration of the nitric acid produced is 56 per cent There is another, older plant (built in 1963) which uses technology from the USSR and has a capacity of about 750 tons per day. This plant produces acid at 49 per cent concentration and operates at a pressure of 2.5 atm throughout.

An ammonium nitrate plant with capacity of 900 tons per day supplied by Sybetra, using Kaltenbach technology. The bagging and finished-product handling section was inspected. The ammonium nitrate was not coated before bagging. Apparently coating is done at the

greeted the delegates, and C. Keleti presented the over-all programme for the Meeting.

There were 52 participants from 12 countries and 2 from FAO: 18 experts from 10 countries (Bulgaria, Cyprus, Hungary, Italy, Malta, Poland, Romania, Turkey, United States of America and Yugoslavia) and 1 from FAO; 34 observers from 6 countries (Federal Republic of Germany, Hungary, Norway, [illegible], Romania and the United Kingdom of Great Britain and Northern Ireland) and 1 from FAO.

Twenty technical papers and country reports were presented and discussed. There were also field trips to the Craiova Chemical Complex and the Fundulea Agricultural Research Institute.

The Meeting achieved its objectives; several countries defined specific sectors in which they could offer help to others or in which they needed assistance.

The various suggestions made on the questionnaire forms distributed at the Meeting are incorporated in III. Conclusions and recommendations.

The Meeting closed with summary speeches and messages of thanks from A. Lungu, C. Keleti and C. Hera.

distribution end. There is also a plant built in 1963 according to UIAP technology, with a capacity of 300 tons per day.

The Cariova complex employs about 6,000 people. It is very well maintained and operates under strict technical control. The new nitrogen fertilizer plants are as up to date as any others in the world.

Management is attending to the pollution problems created by the fertilizer plant. Solutions to the problems of atmosphere pollution by dust from the ammonium nitrate plant and nitrogen oxides from the old nitric acid plant are under investigation. The new Grande Paroisse nitric acid plant operates with a vent gas containing 200 ppm nitrogen oxides and 2.5 per cent oxygen. This emission level, averaged over continuous operation, would be acceptable anywhere in the world. It is apparently obtained without catalytic fume-abatement systems.

One of the participants commented on the high level of noise in the plant. Mr. Popa agreed that the noise level was a nuisance and probably exceeded the 80 phons accepted in other countries as a maximum threshold level. This problem was also being investigated by the technical group, and improvements were expected soon. J. Wozniakowski of Poland offered technical assistance to Romania in the matter.

The Cariova complex can also produce prilled calcium ammonium nitrate with a concentration of 24-26 per cent N.

Certain other plants, such as the acetylene plant using the partial oxidation process and the oxygen plant built in accordance with Russian technology, were not inspected.

Construction has begun on a 2,700-ton-per-day NPK-fertilizer prilling plant using Norsk-Hydro technology.

B. Visit to the Fundulea Agricultural Research Institute

The Fundulea Agricultural Research Institute, the largest of the 18 agricultural and forestry research institutes in Romania was visited during the Meeting by a group of seven participants. The staff of about 330 scientists, 60 of whom are Ph.D.'s, investigate the genetics, agrotechniques, biochemistry and biology of cereals and industrial crops. These crops comprise about 85 per cent of the country's agricultural production.

The Institute has a distinguished scientific history marked by such achievements as the development of the first simple sunflower hybrid with high oil content and good resistance to mildew, and the breeding of Helminthosporium-resistant corn seed for the United States of America.

A new modern building for the Institute, to which FAO is contributing staff and equipment worth $2 million, is now under construction.

While the Institute takes an integrated approach to the problem of crop protection, chemical control receives top priority.

The visitors had an excellent opportunity to learn about the current programme of the chemistry and biochemistry departments. The small-plot herbicide tests on sunflowers and field corn, which aim at minimum tillage, were particularly interesting.

III. CONCLUSIONS AND RECOMMENDATIONS

1. The papers presented and the discussions generated by them provided a useful survey of the status of fertilizer and pesticide consumption, production and problems in the countries represented.

It is therefore recommended:

(a) That the papers presented at the meeting should be published and made available to all participants in their home countries as quickly as possible;

(b) That more meetings of this kind should be organized by UNIDO to provide for a regular exchange of ideas;

(c) That manufacturing and contract engineering companies should be encouraged by UNIDO to participate in such meetings;

(d) That similar meetings should be held biennially in future;

(e) That as far as possible, copies of papers to be presented at future meetings should be sent to participants well in advance, so that questions can be presented to the author early enough for him to prepare answers;

(f) That detailed papers should be presented in summary form to allow more time for productive discussion.

2. Each country was represented by separate delegations for the fertilizer and pesticide industries.

It is therefore recommended:

That the proceedings of the fertilizer and pesticide sections should run concurrently.

3. Data on fertilizer production and consumption were at times presented in the form of total tonnage of nutrients: $N + P_2O_5 + K_2O$.

It is therefore recommended:

That, at future meetings, fertilizer statistics should specify the nutrients N, P_2O_5 and K_2O separately.

4. Bulk distribution of fertilizers is expected to become increasingly mandatory, mainly because of the need to reduce agricultural manpower requirements in the coming years.

It is therefore recommended:

That as soon as possible UNIDO should study the bulk handling and distribution of fertilizers, at the same time taking into account the existence of small farms in some countries.

5. Some countries find it difficult to obtain supplies of raw materials and intermediates for their manufacturing industries.

It is therefore recommended:

That UNIDO should (a) collect information on the supply of raw materials and intermediates for the fertilizer and pesticide industries and (b) encourage joint ventures.

6. The disposal of waste gypsum is an important and growing problem.

It is therefore recommended:

That as a matter of urgency, UNIDO should collect information on techniques for using gypsum as a sulphur source or in the manufacture of plaster board and on the economics of these techniques.

7. The caking of fertilizers is still a problem.

It is therefore recommended:

That UNIDO should initiate a search for new anti-caking agents.

8. The agricultural application of micronutrients such as zinc, magnesium, manganese and boron is becoming increasingly necessary.

It is therefore recommended:

That UNIDO should initiate studies on effective methods for the incorporation of micronutrients into fertilizers.

9. The use of liquid fertilisers, including anhydrous ammonia, is of growing importance.

It is therefore recommended:

That UNIDO should arrange for an early meeting to study in detail problems connected with the use of liquid fertilizers.

10. A variety of different methods are now being used for the analysis of fertilizers and pesticides and for the determination of pesticide residues.

It is therefore recommended:

That UNIDO should assist in (a) standardising analytical methods, (b) surveying the types of analytical instruments available and (c) training personnel in modern analytical techniques.

11. Several countries already at a certain stage of development could contribute from their own experience to help with the development of fertilizer production in other countries.

It is therefore recommended:

(a) That countries should periodically inform the Joint UNIDO/Romania Centre, via UNIDO, of (i) new solutions to problems and (ii) problems in which they still need technical assistance;

(b) That the Joint UNIDO/Romania Centre should act as a clearing-house by organizing meetings on specific subjects of interest to both developed and developing countries;

(c) That the Joint UNIDO/Romania Centre should promote feasibility studies and technical assistance in the formulation of recommendations for the development of national fertilizer industries;

(d) That the Joint UNIDO/Romania Centre should provide facilities for technical training of staff from interested developing countries in Romanian fertilizer plants.

12. Developing countries with limited local demand cannot afford to build a separate plant for each basic pesticide they need.

It is therefore recommended:

That UNIDO should study the feasibility of designing versatile multipurpose pesticide plants.

13. The art of pesticide formulation is highly proprietary, and little published information on its principles and techniques is available.

It is therefore recommended:

(a) That publication of the forthcoming UNIDO book on in-plant training programmes on the principles of formulation and production of pesticides in developing countries should be expedited;

(b) That UNIDO should convene a working group that brings together industrial representatives of both developed and developing countries to deal with this problem on a bilateral basis and to develop guidelines for more efficient operation in the mutual interest of both parties;

(c) That UNIDO should investigate the possibility of setting up a research and development centre to serve member countries in the solution of their research, manufacturing and training problems in pesticide formulation and application.

14. There is a growing public awareness of the environmental pollution that can be caused by the fertilizer and pesticide industries.

It is therefore recommended:

(a) That efforts to prevent such pollution should be intensified;

(b) That UNIDO should study technological improvements in manufacture and packaging that can result in the reduction of industrial pollution. (It is good news that UNIDO has already started to plan a conference on this important subject.)

15. Problems related to the use of pesticides, particularly hazards to the user and the persistence of harmful residues, have become quite important.

It is therefore recommended:

That UNIDO should solicit FAO and other interested bodies to establish without delay a research and co-ordinating centre which would undertake the following activities:

(a) Study of compounds such as benzene hexachloride which are no longer covered by patents but are used in developing countries

(b) Investigation of chemical-technical problems related to the production of narrow-spectrum insecticides

(c) Investigation of problems related to environmental pollution by agricultural chemicals and the occurrence of their residues in food

List of papers presented to the Meeting[a/]

ID/WG.127/4	Trends in fertiliser production Travis P. Hignett, USA
ID/WG.127/5	Sulphuric acid production technology and plant construction in the People's Republic of Poland Jan Wosniakowski, Poland
ID/WG.127/6	Granular pesticides Otto Zeiser, Italy
	FAO's activities in fertiliser use development F.W. Hauck, FAO, Rome
	The fertiliser industry in Romania and other developing countries in the ECE region Nicolae Popovici, Romania
	Development of pesticide production in Romania Silvia Nicolau, Romania
	Status of the fertiliser industry in Bulgaria Stefan Lasarov, Bulgaria
	Conditions and problems of the pesticide industry of Bulgaria Stojan Gaitandjiev, Bulgaria
	Fertilisers in Cyprus Petrakis Markou, Cyprus
	Report on pesticides in Cyprus John P. Kyngas, Cyprus

a/ A limited number of copies is available from UNIDO upon request.

Situation of the fertiliser and trend of its development in Hungary

Tibor Szifkov, Hungary

Production and use of plant protection chemicals in Hungary

Ferenc Hargitai, Hungary

The importance of pilot plants for the industrial development of new processes

Iuliu Moldovan, Romania

The production, use and export of nitrogen fertilisers in Poland

Jerzy Simonides, Poland

The pesticide industry in Poland

Stanislaw Byrdy, Poland

The fertiliser industry of Turkey

Güngör Cangara, Turkey

The pesticide industry of Turkey

Güngör Cankara, Turkey

The fertiliser industry of Yugoslavia

Anton Visovisek, Yugoslavia

Production of pesticides in Yugoslavia

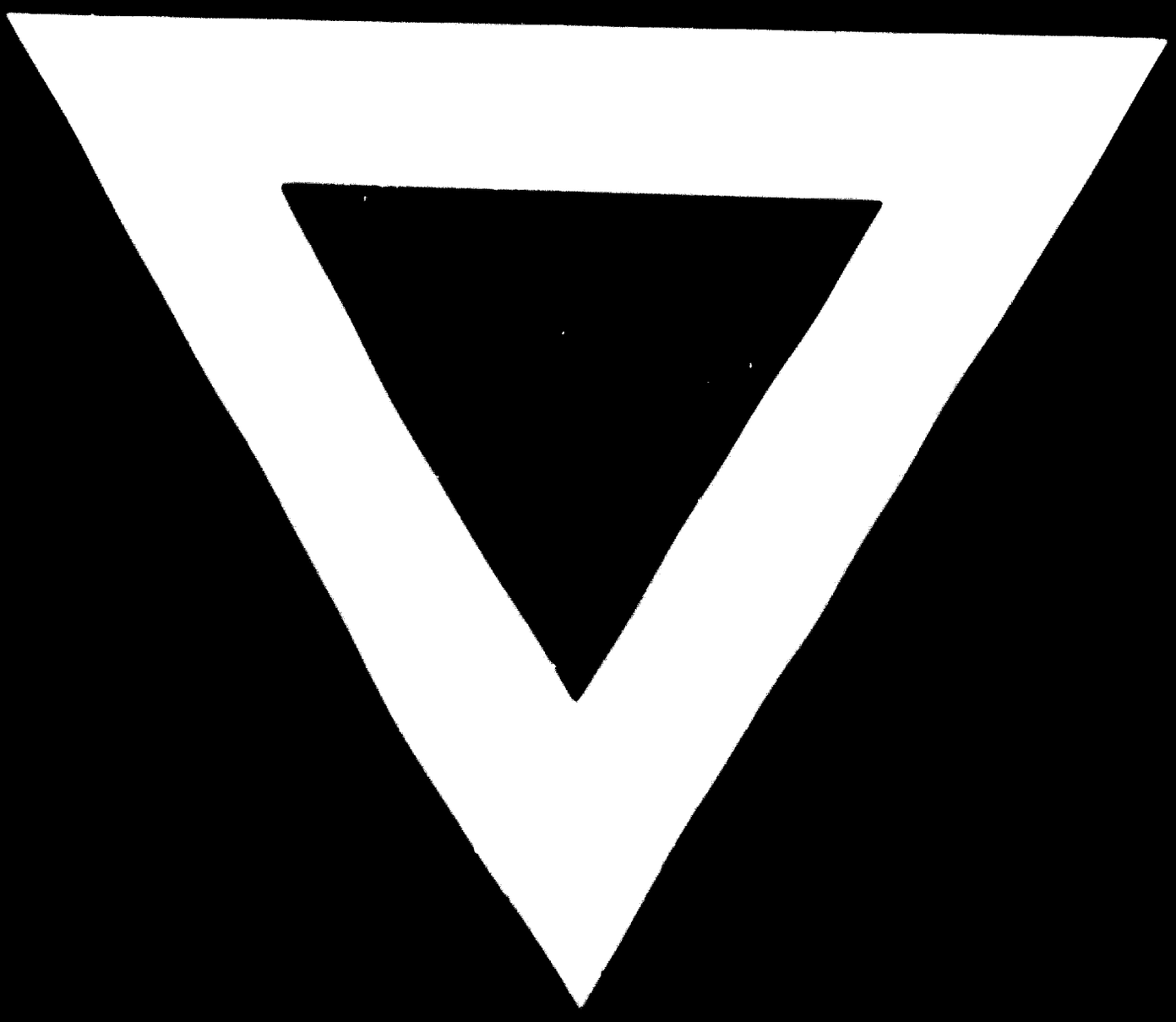
Anton Visovisek, Yugoslavia

Fertilisers in Malta

Peter V. Calamatta, Malta

Pesticides in Malta

Peter V. Calamatta, Malta



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