Report from a visit to Poland December 15-20, 1997: Identification of possible partners in environmental related sector programs of the Danish Ministry of Food, Agriculture and Fisheries.

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January 16, 1998
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Erik Kirknel, Bent Bromand and Henriette Hossy

DIAS Flakkebjerg.

Background

The Directorate of Development, The Ministry of Food, Agriculture and Fisheries, has requested The Danish Institute of Agricultural Sciences (DIAS), through Research Centre Flakkebjerg to carry out project identification in Poland and the Baltic Countries. The projects should fit into The Ministry's Environment Related Sector Program 1996 (323 29/5 96).

The Ministry has asked for a survey of the need for co-operation in the harmonisation process to the EU directives, with respect to an efficacy testing system for pesticides suitable for the purpose of registration as well as a basis for environmentally sound advising of the farmers. In addition, the Ministry wants a survey of the need for a certificate for spraymen, and an obligatory system for control and acceptance of the spray equipment. Furthermore, an evaluation of the possibility of implementing a computerised Plant Protection decision support system should be carried out. Finally, an assessment should be made of the degree to which the country is interested in receiving support and participating in co-operation within defined projects.

Objectives

The overall objective of the first mission is project identification within the framework described under “Background”. Projects will be identified even if they are outside the normal activities of DIAS. This first mission is planned to initiate a constructive dialogue with the counterpart institutions ending up with concrete suggestions from Poland.
Activities

The following

letter of introduction

to potential partners in Poland was sent:

Dear Sir!

I am working on The Danish Institute of Agricultural Sciences in Flakkebjerg and have a task for The Danish Directorate of Development under the Ministry of Agriculture.

The Directorate has asked us to identify potential co-operation projects in the Baltic region and Poland in the area of pesticides, efficacy testing, harmonisation to EU, PC-plant protection, residue analysis etc. The Directorate has set up an economic frame for information flow and necessary hardware. We would ask if it has your interest and is possible for you to receive a visit by a group of three scientists from our Institute in December. Maybe around the 10th and forward? All expenses are paid by us.

I need some contacts, especially in pesticide residue analysis in food (also control body), soil and water, because we have not been in contact with this sector in the past. The different quality assurance systems (GLP, GEP, EN-45 000) will be part of the catalogue too. It is a little urgent for us to get these addresses in order to plan eventual contacts in December.

I know I am rushing the process, forgive me, this is a part of my task!

Hope to hear from you very soon

Best regards

Erik Kirknel
Meetings

December 15

Meeting with Mgr. inz. Barbara Podgórska, Office for registration of pesticides, Ministry of Agriculture, Poznan.

The recently implemented “Law from July 1995 on protection of cultivated plants” was presented in an unofficial English translation.

The decree of the Minister of Agriculture and Food Economy from March 1996 concerning detailed principles of granting the authorisation of plant protection products to be placed on the market in Poland was also presented and the different annexes were discussed eg.:

Toxicity for humans, bees, fish and other aquatic organisms, List of crops for efficacy trial, List of products (formulations), International pictograms, R+S phrases, Banned pesticides (around 50).

It seemed like the Polish laws are close to the EU directives, or could easily be adapted to the directives.

6 months ago a small commission was established in order to evaluate the integration in and harmonisation process to EU directives. The conclusion will be presented to the Ministry of Agriculture in the very near future. The main conclusions are:

1. The implementation of GLP (and EN 45 000) is not completed, but under development. The accreditation bodies are under construction.
2. The implementing of GEP has not been initiated, no official body exist for approval.
3. Urgent need for laboratory equipment (1.7 mill. Zloty) for quality control of pesticides (M.Sc. Stanislaw Stobiecki, Branch IOR, Sosnicowice).
4. Statistics of the specific use of pesticides are absent.

December 16

The meeting with Dr. Dabrowski informed us of the role of his laboratory for pesticide residue analysis. The laboratory was in practice together with the laboratory in Warszawa under the Ministry of Hygiene, making the market control/monitoring of pesticides in plant material and water analysis. Residue trials were made for registration purposes. Dr. Dabrowski was responsible for investigations on farm level and Warszawa was responsible for products just before they reached the consumer. Due to a lack of resources they where co-operating on market control.

Dr. Dabrowski informed us that due to lack of economic resources, the local laboratories were in the last few years reduced from 49 field labs to 5 labs. 2,500 samples per year were analysed for the actual pesticides used. Only 1% of the samples exceeded the maximum residue levels (MRL), 67% were below limit of detection and 32% above limit of detection but below MRL in the period 1991-95. Water samples are regularly collected from 16 localities and analysed. The laboratory is
equipped with modern instrumentation, but needs to be updated and maintenance of the instruments was an economic burden.

The most serious problem is a drain of qualified staff to pharmaceutical jobs. There is an urgent need for training in normal pesticide residue analysis of plant origin, especially to be updated in the use of modern instrumentation. Dr. Dabrowski preferred the training to take place at Danish governmental laboratories instead of on commercial courses. There is an urgent need for training in mass spectrometry especially in water analysis. The need for training was preliminary estimated to 8 chemists each of 2 months duration.

Furthermore, introduction to GLP and participation in intercalibration with similar foreign laboratories was given a high priority. Some technical equipment is urgently needed.

Dr. Wójtowicz, works with forecasting and warnings for plant diseases/pests and with a system similar to the Danish “registreringsnet”. Registrations of disease and pest are collected from all 49 counties in Poland in co-operation with plant protection service (ODR, which is the Polish advisory service). To present data the department has developed a computer program arranging the incoming data. The data is then sent back to all ODR’s in the county. The ODR’s are state owned and have a very low budget, this means no computer equipment and very low salaries. We were told that it looked brighter in the future.

Dr. Wójtowicz is familiar with computers for this type of work and showed great interest in the PC-Plant Protection program. He has validated the PC program NegFry, which forecasts late blight in potatoes, under Polish conditions and after a calibration, he found it very useful.

Dr. Wójtowicz suggested a field validation in one of the disease models in PC-Plant Protection next growth season (1998). He didn’t work with diseases and pests in cereals, but suggested that he could co-operate with the Department of Mycology.

The leader of the Department of Mycology, which has 14 people employed, is Dr. Cecylia Janczak. The department works with:
1. Mycology in cereal, oilseed rape, beans and lupine and other cultures.
2. Efficacy testing of fungicides.

Dr. Marek Korbas works with damage thresholds and benzimidazol resistance in cereals against eyespot. No resistant strains have been found in Poland, which is explained by the very low use of fungicides. One of Poland’s major problems in winter wheat is eyespot and they were very interested in the recommendation model for eyespot in PCP in Denmark. They received a copy of the eyespot model and will compare it to the Polish thresholds and conditions.

Dr. Krzysztof Kubiak works with bunt (Tillettia caries): mainly resistance in winter wheat and seed treatment. He also works with a program of comparing different damage thresholds against Septoria nodorum. 5 different systems are being compared including PCP.

The spraying times varied from June 5 - July 3 first year. July 3 was PCP.
The spraying times varied from June 4 - June 30 second year. June 16 was PCP.
The yield varied from 5,0 - 10,6 kkg pr. ha.

The department has a Hardi MET(eorological) POLE (a mini-meteorological station transmitting data to the Institute) paid by the PHARE program. There are some problems with data transmission and they have been waiting for Danish service, which is a general problem. If equipment breaks down, it takes long time to have it repaired and it is very expensive.
As the department deals with registration, they are very interested in GEP. At the institute’s experimental farm they have started work with GEP, but it is believed that a future GEP-unit will be placed in Poznan. A special group works with GLP. A meeting was held 4 months ago and the plan is to have GLP before the end of 1999. This means that a lot of equipment is needed for different laboratories.

December 17

Prof. Dr. Habil Jan K. Ludwicki, Warszawa, explained the role of the department which was:

1. The toxicological evaluation of the dossiers delivered by the pesticide companies in the registration process
2. The creation of maximum residue limits for pesticides in food
3. Residue analysis done at the consumer level for food.
4. Biological monitoring of pesticides, mainly organochlorines in humans.

49 county laboratories were available when analysing for a range of pollutants also pesticides. Analysis of fruit and vegetables is performed at a much smaller scale than the laboratory in Poznan, but is a supplementary to these results. The difference between the two laboratories is that Poznan analyses samples on the farm level, while the laboratory under The National Institute of Hygiene, analyses only pesticides from the market just before consumption. The results from the Ministry of Agriculture is considered by the consumers to be valid only for the producers of fruit and vegetables. The consumers want their own monitoring program. Results from a 5 year monitoring is presented in Polish. The biggest problem is, too high residues of dithiocarbamates in Poland, as it is in Denmark.

Intercalibration among laboratories, both commercial and government, has just been performed on organochlorine pesticides in edible oil in Poland. The results were presented to us. The results are rather good and within the international accepted limits, the Z-score is within +- 2, except for very few laboratories.

Prof. Ludwicki was very interested in co-operation with the Danish scientific community on:

1. Quality assurance system EN 45 000
2. Multiresidue methods on organophosphate pesticides
3. Knowledge about the registration procedure for pesticides in the Danish Environmental Protection Agency.

The 2 scientists that may be trained under item 2 and 3 in Denmark, would work as instructors for the 49 county laboratories when returning home.

The laboratory did not seem to need further technical equipment, except for air-conditioning in two rooms.
Dr. inz. Marek Wachowiak, Poznan, informed us, that a system for control of spraying equipment has been under preparation for 4 years. The German system from BBA in Braunschweig*) has been adopted.

A scheme has been worked out for checking of sprayers. Poland has around 350.000 pieces of spray equipment. The sprayers must be checked every other year and the start is planned for April/May 1998.

There is an inspector in each of the 49 counties, who delegates the inspections to private companies. These companies must have a fully equipped vehicle, (which they do not have today) to control pressure of tanks, manometers and nozzles and they must be able to measure volumes of tanks, output of nozzles etc.

The procedure will be that the mobile test stations visit villages, where the farmers must meet with their sprayers in order to have them checked. This will cost the farmer 50-100 zloty. During the first year they will be subsidised. The sprayer must not be used unless it is supplied with a certificate. For instance if the sprayer is without a certificate, the farmer is not allowed to send his sugar beet to the factory.

In the beginning there will be no punishment. Random sampling have shown that 80% of the farmers sprayers will not pass the control.

50 instructors have been educated at this institute and they teach inspectors at 5 different places Torim, Tarnuf, Radom, Wroclaw and Poznan. About 1.000 people have been educated for 3 days in order to carry out the inspection of sprayers. There is a fixed program for the education.

Farmers are educated on a voluntary basis which last one day. Most farmers in the western part of Poland have participated in a course. A handbook of 164 pages exists. The book deals with safety, something about pests and diseases, construction of the spray equipment, how it functions and how it is calibrated.

The department wants to buy a test board (Lurmark) for testing the spray pattern of sprayers, but it is very expensive. 3 Polish companies have started to make new test boards. An electronic test board was mentioned, which automatically writes out the results, priced in the range of 30.000 DM. For the practical testing units about 1.000 testing equipment’s including a basin for collecting the spraying fluid are needed.

2 institutions have contact to the farmers: PIOR, which is a controlling agency.
ODR, which is the advisory service. However, the advisory service is poorly educated, they are poorly equipped and they have low salaries. Another problem is that farmers have little confidence in the advisory service and the farmers get most of their advice from dealers of heavy goods who sell the pesticides.

December 18

The meeting with The Director of The Plant Protection Institute, Dr. Pruszynski, was started with expressing a warm welcome to the Danish initiative and a brief introduction to The Plant Protection Institute. We informed Dr. Pruszynski about the contacts already made by the help of Dr. Dabrowski. Dr. Pruszynski expressed a wish for Danish help to introduce low input agriculture in Poland. Poland wishes that the present use of 0.5-0.6 kg. active ingredient per ha., could form the basis for integrated crop protection instead of increasing the pesticide use in general. This could be a future program for a healthy agriculture in Poland. In fruit growing, a good system of low input pesticides exists with participation of 6-800 growers. Dr. Pruszynski also expressed the importance of introducing GEP in Poland. A co-ordination of the desired items for co-operation was needed, especially on introducing GEP in efficacy trials was necessary. It was agreed that we proceeded with contacting the individual groups of scientists, informed them about our plans, but an internal decision in The Plant Protection Institute will take place after their Plant Protection Conference in first half of February.

Dr. K. Adamczewski and Dr. T. Praczyk, informed us of his engagement in efficacy testing of herbicides for pesticide registration. He has already been in contact with Per Kudsk from DIAS’s Research Centre Flakkebjerg and was very interested in closer contact with Per Kudsk regarding the testing of herbicides in reduced dosages. These data were necessary if PC-Plant Protection in weeds, should be introduced at a later stage. Dr. Adamczewski was also interested in transfer of technical knowledge regarding modern experimental spray equipment, which was introduced to him. GEP was a must also for his field trials he realised and accepted a co-operation on this field also. In the discussion, it appeared clear to everybody that other institutes in Poland including the universities, have been forced to introduce GEP. Dr. Adamczewski will bring this topic up for internal discussions with the Director described above. In 1998 it was suggested that 2 persons should be stationed in Flakkebjerg for a period of 3 months. Decision support systems (DSS) weren’t a new subject. They have developed a sugar beet program. The program contained a list of weeds species, in which the species to be controlled was indicated and it suggested a herbicide – a kind of reference book. When we discussed DSS and the Danish PC-Plant Protection was demonstrated Dr. Adamczewski explained that this was the kind of system what they are aiming at but haven’t had the resources to do so.

Prof. Dr. habil Jan Nawrot, Head of Department for Entomology gave an orientation. Pesticides are tested in many different crops. Basic research is carried out with the Colorado beetle where the effect of hydrocarbons on the cuticle is being investigated as well as the defence mechanisms of the beetles.

In oilseed rape, many varieties are being used and many pests attack the crop. Dr. Jan Nawrot is looking forward to transgenic plants.

In potatoes the Colorado beetle is the most important pest, resulting in usually 30% damage. This is where most insecticides are being used, including Bacillus thuringiensis preparations.

In sugar beet the beet leaf bug (Piesma quadratum) is very serious pest insect, because it is a vector for virus diseases especially in the Poznan area. 20 years have elapsed without any attacks, but in
the later years this pest has caused great damage. For aphids a suction trap is being used and next year another trap will be put up.

In seed grasses 2 different Diptera causes damage and in cowpea mainly Bruchus species causes damage.

At the institute’s experimental farm, Winogora (600 ha), there are about 5.000 plots with efficacy trials of pesticides. The institute has good contact to the companies and the companies inspect the trials twice during the season. The experimental farm is also used for demonstration trials.

A special group works on the implementation of GEP and GLP. The Polish Committee on Quality and Normalisation can give certification. The institute arranges many courses for farmers and publishes recommendations for farmers. Every other year, 3 books are made with crops, pests, chemicals, doses and remarks. We were told that a computer program exists for farmers!

Director of The State Plant Protection Inspectorate Service, Mr Ryszard Witkowski was visited in order to get further information on the obligatory education of spraymen and test of spray equipment. He informed that the education has started in the regions, but everybody was waiting for instructions from the Ministry of Agriculture on how to implement the law. He recommended us to contact the Ministry of Agriculture in Warszawa regarding co-operation on this issue, which was done the next day.

Prof. Dr. habil Jerzy J. Lipa, and Ph.D. Marek Tomalek, informed us of their work with predators and parasites to insects. Biological control in glasshouses is carried out to a minor extent. Poland does not have a noticeable production in glasshouses.

December 19

A meeting was held in The Ministry of Agriculture with participation of Director M. Jerzy Nasiadko and Director Adam Zych. The issue was a general information of the task of the Danish delegation and more specific a clarification of the status of the certificate for spraymen and the control of spray equipment.

Finally, the desire for Danish support in implementing these tools in modern administration of pesticides in plant production was discussed.

The “Law from July 1995 on protection of cultivated plants” says in article 35 and article 36, that spraymen must be trained and obtain a spray certificate and spray equipment should be tested before use. The more specific description on how the law will be implemented, is under construction and will be materialised in decrees. This document will contain descriptions of who will be in charge of education, testing, requirements etc. The law is planned to be adopted in the middle of 1998 and enter into force January 1. 1999.

Within the PHARE-program, 5 centres have been established for instruction of testing of equipment and training of instructors. It was the impression that this testing and education programme was
already started. A group of Polish scientists has been on a study tour in Denmark in October 1997.
300-500 stations will on a commercial basis be established in the future.

The education and test programme is on a voluntary basis until January 1. 1999. After this date the
farmers have 24 months to get their equipment tested and obtain a spray certificate, in other words it
will be obligatory. After this period, January 1. 2001, farmers will be punished if not obeying the
law.

The Ministry was very interested in Danish economic support which together with other sources
would speed up the implementing of the law. The support needed was indicated to be:

1. Financial support to test equipment for the 5 official centres. It should be a subject of discussion
   if the equipment should be donated from Danish deliverer or produced in Poland.
2. Scientific support as for example training in Denmark.
3. Training of staff members in handling the equipment at the 5 centres.
4. Economic support to the fee farmers should pay after January 1. 1999. This support would be
   reduced annually and finally stop.

Adam Zych will be the contact person.
Main Conclusions of the Mission.

Introduction

The mission's main objective was to initiate the identification of projects that may be eligible for support from The Danish Ministry of Food, Agriculture and Fisheries within the following areas:

- adaptation and harmonisation of the laws, regulations and procedures for efficacy testing of pesticides and other activities concerning bringing plant protection agents on the market.
- pesticide sprayers certificate,
- inspection system for spray equipment
- computer based systems for decision making on the use of pesticides in plant protection

The main development objectives of these projects will be to develop safe use of pesticides, both of human and environmental aspects, in agriculture in Poland.

This report presents the main finding of the project identification mission fielded in December 1997. It summarises the impression on the Danish delegation to be presented to the Polish counterpart for comments and to be used in the further planning process.

Main Conclusions

A series of meetings were held at The Plant Protection Institute, in Poznan as this institute plays a central role in research and experiments with pesticides.

It was the impression of the Danish delegation, that the following items had the interest of our Polish colleagues. The items can be fully recommended for future co-operation:

1. The Director of the Plant Protection Institute, Dr. Stefan Pruszynski expressed a strong wish for co-operation with Denmark in order to maintain the low level of inputs of pesticides at the present in Polish Agricultural production. Poland uses only 0.6 kg. active ingredient per ha. There was a clear interest that our Polish colleagues also wish to implement other means of managing pests and diseases than pesticides.

2. A key issue in the harmonisation process to EU-directives on pesticides is introduction to and implementing of Good Experimental Practice, GEP in efficacy testing. GEP has not yet been planned in Poland, but it was expressed that co-operation with the Danish authorities was desired. The co-operation could involve courses in Denmark and Poland with practical demonstrations in Denmark. GEP should also include test procedures for spray equipment used for efficacy trials. The co-operation should preferably be planned on a training of trainers basis, and start as soon as possible in 1998. Interest was expressed in studying spray equipment used in efficacy testing under Danish conditions.

3. Other quality assurance systems, such as Good Laboratory Practice, GLP, and EN 45000, are necessary in chemical laboratories analysing pesticides in food, drinking water etc. The Department of Residues in Poznan and The National Institute of Hygiene, Department of Environmental Toxicology in Warszawa expressed interest in working in a Danish laboratory
working with pesticides residue analysis in food and drinking water accredited to for example EN 45000. The system is planned to be introduced in Poland in the future, but training is not available in any national laboratory yet. This project is suggested to include training in Denmark only. The laboratory in Warszawa could be trained to train the 49 county laboratories.

4. The Department of Pesticide Residue Analysis in Poznan is relatively well equipped with the more expensive type of analytical equipment (donated by international agencies), but need limited economic resources for smaller pieces of equipment and repairs. Few items missing can sometimes slow down the speed of analysis or even stop the work for a longer period of time.

5. The two chemical laboratories mentioned have also expressed strong interest in training in modern analytical methods of analysis of pesticides, analytical instrumentation, including a course in mass-spectrometry in the analysis of pesticides in water analysis.

6. The National Institute of Hygiene, Department of Environmental toxicology in Warszawa expressed interest in becoming familiar with the Danish system of pesticide registration procedures in The Danish EPA.

7. The Polish colleagues showed considerable interest in all aspects of PC Plant Protection, both for weeds and fungal diseases (including seed borne diseases). The time was too short to define specific areas of interest. Therefore, DIAS suggests that a 2-3 days workshop should be arranged in Denmark at Research Centre Flakkebjerg for Polish scientists, in order to carry out an in-depth planning of future PCP projects. It is extremely important for the PCP projects, that both partners, the Polish and the Danish, mutually inform in depth of their interest and capacity in the projects at this stage.

8. The Department of Weed Control was very interested in the Danish experiences of data collection on reduced herbicide dosages. These data are necessary for development of PCP in weed control.

9. An issue of great importance was the quality control of formulated products in Poland. There is a need for equipment in chemical analysis. If farmers can not rely on high quality products available on the market, the results from the efficacy testing of pesticides are more or less useless.

10. The office for registration of pesticides mentioned the absence of more detailed statistics of the use of pesticides. These figures are essential when the national authorities have a desire of regulating the use of pesticides on the market. We were told it was a financial problem.

Spray Certificate and Inspection System for Spray Equipment

A meeting was held in The Ministry of Agriculture and Food Economy, with participation of The Director M. Jerzy Nasiadko of Department of Agricultural Production, The Ministry of Agriculture and Food Economy and Director Adam Zych, State Plant Protection Inspection, Main Inspectorate, located in The Ministry of Agriculture and Food Economy, Warszawa. The issue was a general
information of the task of the Danish delegation and more specific a clarification of the status of the certificate for spraymen and the control of spray equipment.

Finally, the desire for Danish support in implementing these tools in modern administration of pesticides in plant production was discussed.

The “Law from July 1995 on protection of cultivated plants” says in article 35 and article 36, that spraymen must be trained and obtain a spray certificate and spray equipment should be tested before use. The more specific description on how the law will be implemented, is under construction and will be materialised in decrees. This document will contain descriptions of who will be in charge of education, testing, requirements etc. The law is planned to be adopted in the middle of 1998 and enter into force January 1. 1999.

Five centres have been established for instruction of testing of equipment and training of instructors under a PHARE project. It was the impression that this testing and education programme has already been started. A group of Polish scientists have been on a study tour to Denmark in October 1997. 300-500 stations will be established in the future on a commercial basis.

The education and test programme is on a voluntary basis until January 1. 1999. After this date the farmers have 24 months to get their equipment tested and obtain a spray certificate. In other words it will be obligatory. After this period, January 1. 2001, farmers will be punished if they do not obey the law. 350.000 farmers are planned to be educated, 312.000 spray equipment to be tested and 1500 persons trained to be responsible for the testing.

The Ministry was very interested in the Danish economic support which together with other sources would speed up the implementing of the law. The support needed was indicated to be:

1. Financial support for purchase of test equipment for the five official centres. A subject of discussion is whether the equipment should be donated from Danish government or produced in Poland.
2. Scientific support including training in Denmark.
3. Training of staff members in handling the equipment at the five centres.
4. Economic support to the fees farmers should pay after January 1. 1999. This support would be reduced annually and finally stopped.

Adam Zych will be the contact person.
Appendix I

Itinerary.

December 15

Arriving at Poznan Airport.
Meeting with
Mgr. inz. Barbara Podgórska,
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Office for registration of pesticides
ul. Miczurina 20
60-318
Poznan.
Phone: +48 61 8 64 92 73
Fax: +48 61 8 67 11 75 or +48 61 8 67 11 75

December 16

Meeting with
Dr. Jerzy Dabrowski (Phone-46), M.Sc. A. Nowacka and M.Sc. B. Martinek.
Department of Pesticide Residue Analysis.

Mgr. inz. Andrzej Wójtowicz.
Department of Methods and Forecast.

Dr. Cecylia Janczak, Mgr. inz. Krzysztof Kubiak and Dr. Marek Korbas,
Department of Fungal Diseases and Control.

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December 17

Meeting with
Prof. Dr. habil Jan K. Ludwicki,
National Institute of Hygiene,
Department of Environmental Toxicology,
Chocimska 24
00-791 Warsawa.
December 18

Meeting with
Director, Professor Dr. habil Stefan Pruszynski.

Prof. Dr. habil. Jan Nawrot,
Department of Agricultural Entomology.

Dr. Stefan Wolny,
Department of Research planning, Extension and Foreign Relations,
and
Mgr. H. Lukomska
(Moderators and contact generator this day).

Prof. Dr. Kazimierz Adamczewski, and Dr. Tadeusz Praczyk
Department of Herbology and Plant Protection Technique.

Prof. Dr. habil Jerzy J. Lipa,
Department of Biocontrol and Quarantine,

Ph.D. Marek Tomalek,
Department of Pest and Disease Control.
Laboratory of Insect Pathology

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Director Mr. Ryszard Witkowski,
State Plant Protection Inspectorate Service,
December 19

Meeting with
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00-930 Warszawa.

Phone/Fax numbers may be subject to changes.

Abbreviations
DIAS Danish Institute of Agricultural Sciences
GLP Good Laboratory Practice
GEP Good Experimental Practice
IFOAM International Federation of Organic Agricultural Movement
IOR Plant Protection Institute (In Poland)
ODR Agricultural Advisory Centres (In Poland)
PIOR State Plant Protection Inspectorate Service
EPA Environmental Protection Agency
NPK Nitrogen-Phosphorous-Kalium (=Potassium)
VAT Value Added Tax
R+S Risk and Safety
MRL Maximum Residue Limits
PCP PC (personal computer based) Plant Protection
Z-score Statistical expression for distribution of data
BBA Biologische Bundes Anstalt
DSS Decision Support System
PHARE Poland, Hungary Assistance for Restructuring of the Economy
Appendix II

Summary of Polish agriculture.

If the year is not indicated, the statistics are valid for 1996.

The area of Poland is 313,000 km², 59% is agriculture, 28% forest and 13% urban area and roads. Yearly precipitation averages 500-600 mm. 90% of the land is below 300m altitude. Poland has a population of 38.6 mill., where 38% live in bigger cities and 38% in agricultural areas (= 14.7 mill.). The country is divided in 49 counties. Agriculture and forestry contribute to BNP with 5.8%. 28.1% of the working population (= 4.4 mill.), are employed in the agriculture, 0.4% in forestry and 0.1% in fishery. 94% of the people working in agriculture are owners or family members. 22% of the farms have a telephone and 48% receive water from the public system.

The agricultural area is 18.5 mill. ha which is 13.5% of the agricultural area in EU. The area per inhabitant is 0.45 ha compared to 0.55 ha in Denmark.

Poland has 2.0 mill. farms (=28% of EU) with a minimum of 1 ha. The average is 9 ha, for private farms 7.7 ha, with the larger farms placed in the northern part of the country.

Grain is grown on 8.651 mill. ha (wheat 2.480 ha, rye 2.415 ha and other species 3.755 ha) Leguminous crops (for human consumption), 0.046 mill. ha. Potatoes, 1.342 mill ha. Crops for industry, 0.757 mill. ha (sugar beets 0.453 mill. ha., rape 0.283 mill. ha., other 0.022 mill. ha. Fodder crops 0.863 mill. ha (root crops 0.117 mill. ha., other 0.746 mill. ha.) Other crops 0.415 mill. ha. (vegetables 0.237 mill. ha., other 0.179 mill. ha.)

The value of crop production in 1996 was 59% of the total production and 39% of the total sales from agriculture. The share of the total sale for grain was 10%, fruit 8%, vegetable 7%, sugar beets 6% and potatoes 4%. From 1994-96, grain was grown on 67.1% of the area, potatoes on 12%, fodder beet on 8.6%, rape on 3.3%, sugar beet on 3.2%, vegetables on 2.1% and other crops on 3.7%. In addition, fruit is grown on 1.4% of the area including 84% with apples. The area with grain is 25% of area in EU, but 14.7% of the value. In 1995, the grain area was composed of 22% winter wheat, 7% summer wheat, 29% rye, 2% winter barley, 10% spring barley, 7% oats, 7% triticale and 16% mixed grain.

The 1995 harvest of potatoes and sugar beet accounted for 55% and 12% respectively of the harvest in EU.

The use of NPK fertiliser was 195 kg/ha in 1988, dropped in 1992 to 82 kg/ha and 88 kg/ha in 1997. The average use of pesticides was 1.15 kg/ha in the period 1986-90, 0.36 kg/ha in 1991, 0.48 kg/ha in the period 1992-95 and 0.6 kg/ha in 1996.
The value of the animal production was in 1996, 41% of the total production and 61% of the total sales from agriculture. The share of the total sales for pigs was 26%, milk 10%, cattle meat 8%, poultry 7% and eggs 4%.

50% of all farms have pigs. 42% have less than 5 pigs, 5.3% have more than 50 pigs and 0.1% have more than 1000 pigs. In 1995, Poland had 17.7% of the total number of pigs in EU and 11% of the production of pig meat in EU. An increasing part of the meat is sold on a private basis.

28% of all cattle are on farms with less than 4 head of cattle, 51% of all cattle are on farms with 5-19 head per farm and 21% on farms with more than 20 head per farm. The production has decreased from 1986-90 to 1995 by 50%, which in 1995 was 5% of the production in EU.

The production of sheep decreased from 1990-91 to 1996 with 85%, but the production of poultry has been stable since 1986-90 and is expected to increase.

Before 1989 70% of the milk production was brought to the dairy, in 1995 only 54%. The production in 1995 was 10% of the total EU production.

50% of the farms have no tractor and 52% of the tractors are below 54 HP. 70% of all tractors are more than 10 years old, 24% more than 20 years old. 24% of the farms have not 380w installed. At present 350,000 spray equipment are operating on Polish farms.

On average 20 persons are employed in agriculture per 100 ha, compared to less than 4 in Denmark.

300 farms (= 4.300 ha ~ 0.03% of total area) in Poland are registered as ecological farms, mainly by the private organisation EKOLAND with similar rules to IFOAM. The rest are registered by two other private organisations. No official system for approval of ecological production exists. Law proposals are expected earliest in 1998.

There do not exist any agricultural-environmental law collection. The main environmental problem seems to be storage of manure.

20% of the farmers are full-time employed with agriculture, 40% are supported by social benefits with practically no production. Income from normal agriculture is free of tax. Only specific production as glasshouse production, poultry breeding, fur production etc. are taxed. VAT is not used in production except for gasoline etc. Tax on land is normal. Only few farms have bookkeeping.

The advisory service in agriculture, which is economically supported by the government, is administered by the counties and The Ministry of Agriculture. An advisory unit (ODR) has been established in each of the 49 counties, and managed by a committee representing the users. All activities are approved by the committee. The influence by the users are evaluated to be modest. An important task for the advisory service is to develop production plans for farmers applying for government support loans. Short courses for farmers are arranged by the advisory units. The number of advisors in Poland is around 4.700 at the present moment.
The Ministry of Agriculture is running approximately 625 “agricultural schools”, employing 15,200 teachers. They are normal public schools but with extensive education in agriculture in the higher grades. The Ministry of Education has 292 similar schools. 12 similar private schools exist. The Ministry of Education administer 9 agricultural universities with 60,000 students.

Agricultural research and experiments are carried out at 23 institutions under The Ministry of Agriculture, the 9 agricultural universities and on 8 research institutes under The Academy of Science. Finally, are few specific areas of research placed under other ministries. A total staff of 15,600 (reduced with 30% since 1989) work with research, experiments and education within the agricultural area, inclusive 1,800 professors on the universities. A reorganisation has been prepared for a long time.