

**Unclassified**

**ENV/JM/MONO(2005)12**



Organisation de Coopération et de Développement Economiques  
Organisation for Economic Co-operation and Development

**10-May-2005**

**English - Or. English**

**ENVIRONMENT DIRECTORATE  
JOINT MEETING OF THE CHEMICALS COMMITTEE AND  
THE WORKING PARTY ON CHEMICALS, PESTICIDES AND BIOTECHNOLOGY**

**ENV/JM/MONO(2005)12  
Unclassified**

**OECD SERIES ON PESTICIDES  
Number 28**

**Report of the OECD Pesticide Risk Reduction Steering Group  
Seminar on Pesticide Risk Reduction through Good Container Management**

**22 June 2004, Bonn, Germany**

**JT00183835**

Document complet disponible sur OLIS dans son format d'origine  
Complete document available on OLIS in its original format

**English - Or. English**



**Report of the OECD Pesticide Risk Reduction Steering Group  
Seminar on Pesticide Risk Reduction through Good Container Management**

**Bonn, Germany  
22 June, 2004**

### **Also published in the Series on Pesticides**

- No. 1 *Data Requirements for Pesticide Registration in OECD Member Countries: Survey Results* (1993)
- No. 2 *Final Report on the OECD Pilot Project to Compare Pesticide Data Reviews* (1995)
- No. 3 *Data Requirements for Biological Pesticides* (1996)
- No. 4 *Activities to Reduce Pesticide Risks in OECD and Selected FAO Countries. Part I: Summary Report* (1996)
- No. 5 *Activities to Reduce Pesticide Risks in OECD and Selected FAO Countries. Part II: Survey Responses* (1996)
- No. 6 *OECD Governments' Approaches to the Protection of Proprietary Rights and Confidential Business Information in Pesticide Registration* (1998)
- No. 7 *OECD Survey on the Collection and Use of Agricultural Pesticide Sales Data: Survey Results* (1999)
- No. 8 *Report of the OECD/FAO Workshop on Integrated Pest Management and Pesticide Risk Reduction* (1999)
- No. 9 *Report of the Survey of OECD Member Countries' Approaches to the Regulation of Biocides* (1999)
- No. 10 *Guidance Notes for Analysis and Evaluation of Repeat-Dose Toxicity Studies* (2000)
- No. 11 *Survey of Best Practices in the Regulation of Pesticides in Twelve OECD Countries* (2001)
- No. 12 *Guidance for Registration Requirements for Pheromones and Other Semiochemicals Used for Arthropod Pest Control* (2001)
- No. 13 *Report of the OECD Workshop on Sharing the Work of Agricultural Pesticide Reviews*
- No. 14 *Guidance Notes for Analysis and Evaluation of Chronic Toxicity and Carcinogenicity Studies.*
- No. 15 *Persistent, Bioaccumulative and Toxic Pesticides in OECD Member Countries, (2002)*
- No. 16 *OECD Guidance for Industry Data Submissions for Pheromones and Other Semiochemicals and their Active Substances (Dossier Guidance for Pheremones and Other Semiochemicals) (2003)*
- No. 17 *OECD Guidance for Country Data Review Reports for Pheremones and Other Semiochemicals and their Active Substances (Monograph Guidance for Pheremones and other Semiochemicals), (2003)*
- No. 18 *Guidance for Registration Requirements for Microbial Pesticides (2003)*
- No. 19 *Registration and Work sharing, Report of the OECD/FAO Zoning Project (2003)*
- No. 20 *OECD Workshop on Electronic Tools for data submission, evaluation and exchange for the Regulation of new and existing industrial chemicals, agricultural pesticides and biocides (2003)*
- No. 21 *Guidance for Regulation of Invertebrates as Biological Control Agents (IBCA) (2004)*
- No. 22 *OECD Guidance for Country Data Review Reports on Microbial Pest Control Products and their Microbial Pest Control Agents (Monograph Guidance for Microbials) (2004)*
- No. 23 *OECD Guidance for Industry Data Submissions for Microbial Pest Control Product and their Microbial Pest Control Agents (Dossier Guidance for Microbials) (2004)*
- No. 24 *Report of the OECD Pesticide Risk Reduction Steering Group Seminar on Compliance (2004)*
- No. 25 *The Assessment of Persistency and Bioaccumulation in the Pesticide Registration Frameworks within the OECD Region*
- No. 26 *Report of the OECD Pesticide Risk Reduction Group Seminar on Minor Uses and Pesticide Risk Reduction*
- No. 27 *Summary Report of the OECD Project on Pesticide Terrestrial Risk Indicators (TERI)*

**Published separately**

*OECD Guidance for Country Data Review Reports on Plant Protection Products and their Active Substances - Monograph Guidance* (1998, revised 2001)

*OECD Guidance for Industry Data Submissions on Plant Protection Products and their Active Substances - Dossier Guidance* (1998, revised 2001)

*Report of the Pesticide Aquatic Risk Indicators Expert Group* (2000)

© OECD 2004

*Applications for permission to reproduce or translate all or part of this material should be made to: Head of Publications Service, OECD, 2 rue André-Pascal, 75775 Paris Cedex 16, France.*

## About the OECD

The Organisation for Economic Co-operation and Development (OECD) is an intergovernmental organisation in which representatives of 30 industrialised countries in North America, Europe and the Asia and Pacific region, as well as the European Commission, meet to co-ordinate and harmonise policies, discuss issues of mutual concern, and work together to respond to international problems. Most of the OECD's work is carried out by more than 200 specialised committees and working groups composed of member country delegates. Observers from several countries with special status at the OECD, and from interested international organisations, attend many of the OECD's workshops and other meetings. Committees and working groups are served by the OECD Secretariat, located in Paris, France, which is organised into directorates and divisions.

The Environment, Health and Safety Division publishes free-of-charge documents in nine different series: **Testing and Assessment; Good Laboratory Practice and Compliance Monitoring; Pesticides and Biocides; Risk Management; Harmonisation of Regulatory Oversight in Biotechnology; Safety of Novel Foods and Feeds; Chemical Accidents; Pollutant Release and Transfer Registers; and Emission Scenario Documents.** More information about the Environment, Health and Safety Programme and EHS publications is available on the OECD's World Wide Web site (<http://www.oecd.org/ehs/>).

*This publication was produced within the framework of the Inter-Organisation Programme for the Sound Management of Chemicals (IOMC).*

**The Inter-Organisation Programme for the Sound Management of Chemicals (IOMC) was established in 1995 following recommendations made by the 1992 UN Conference on Environment and Development to strengthen co-operation and increase international co-ordination in the field of chemical safety. The participating organisations are FAO, ILO, OECD, UNEP, UNIDO, UNITAR and WHO. The World Bank and UNDP are observers. The purpose of the IOMC is to promote co-ordination of the policies and activities pursued by the Participating Organisations, jointly or separately, to achieve the sound management of chemicals in relation to human health and the environment.**

**This publication is available electronically, at no charge.**

**For this and many other Environment,  
Health and Safety publications, consult the OECD's  
World Wide Web site ([www.oecd.org/ehs/](http://www.oecd.org/ehs/))**

**or contact:**

**OECD Environment Directorate,  
Environment, Health and Safety Division**

**2 rue André-Pascal  
75775 Paris Cedex 16  
France**

**Fax: (33-1) 45 24 16 75**

**E-mail: [ehscont@oecd.org](mailto:ehscont@oecd.org)**

**TABLE OF CONTENTS**

<b>Introduction</b> .....	9
<b>Participants</b> .....	9
<b>Scope and Structure of the Seminar</b> .....	10
<b>Reviewing Existing Container Management Schemes</b> .....	10
- Australia.....	11
- Belgium.....	11
- Brazil.....	12
- Canada .....	13
- France.....	13
- Germany.....	14
- Hungary .....	15
- USA .....	16
- Developing Countries (especially Africa).....	16
- The Home and Garden Sector (the UK).....	17
<b>Other Stakeholder Perspectives</b> .....	18
- Farmers .....	18
- NGOs .....	18
<b>Roundtable Discussion</b> .....	18
- What is Container Management as a Risk Reduction Tool?.....	18
- Regulatory Actions vs. Voluntary Schemes .....	20
- Economic and Financial Aspects .....	21
- Barriers.....	21
- Opportunities .....	22
<b>Next Steps</b> .....	23
<b>ANNEX 1</b> .....	24
Participants List.....	24
<b>ANNEX 2</b> .....	29
Seminar Presentations and Papers.....	29
<b>ANNEX 3</b> .....	114
Used Pesticide Container Management Schemes: Collection, Rates, Charges and Costs .....	114

## INTRODUCTION

1. This report presents the results of an OECD seminar on ways to achieve pesticide risk reduction through good management of used containers of chemical pesticides.

2. The seminar addressed all phases or stages of pesticide packaging/container management: collection, recycling, disposal, and handling of packaging and of small quantity of left-over pesticides. It also addressed aspects of safe handling of pesticides that are closely related to container management such as filling, mixing and rinsing, as well as container design helpful for safe handling. Both agricultural and home and garden uses were considered, while taking note of the fact that different mechanisms of container management are required by different uses and users. Linkages between good container management and obsolete pesticide management were kept in mind, especially in the context of non-OECD countries.

3. The seminar was hosted by the government of Germany, and was held in Bonn on 22 June 2004. It was chaired by Dr. Wolfgang Zornbach of the German Federal Ministry of Consumer Protection, Food and Agriculture.

4. This was the third in a series of seminars organised by the OECD Pesticide Risk Reduction Steering Group, a sub-group of the OECD Working Group on Pesticides. These seminars focus on key issues in pesticide risk reduction of concern to OECD governments. The seminars are intended to provide an opportunity for OECD governments to discuss the issues together with non-governmental stakeholders and to develop recommendations for further OECD activities.

5. The first seminar in the series addressed compliance by pesticide users, distributors and retailers with the legal requirements and voluntary codes governing pesticide use. The second seminar was on minor uses, small-scale pesticide use most frequently involving pest control in a minor crop or for a small pest problem in a major crop. The reports from these seminars are available on the OECD public web site:

[http://www.oecd.org/document/60/0,2340,en\\_2649\\_34383\\_2073276\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/60/0,2340,en_2649_34383_2073276_1_1_1_1,00.html).

## PARTICIPANTS

6. Thirty people attended the seminar on risk reduction through good container management, including representatives of:

- the pesticide regulatory authorities of Canada, Denmark, Germany, Hungary, Japan, Switzerland and the European Commission;
- the pesticide industry and container management scheme operators in Australia, Belgium, Brazil, Germany, France, and CropLife International (the international association of pesticide manufacturers);
- United Nations Food and Agricultural Organisation (FAO),
- German farmers; and
- public interest organisations (Pesticides Action Network-PAN UK).

7. A participant list is attached as **Annex 1**.

## SCOPE AND STRUCTURE OF THE SEMINAR

8. The purpose of the seminar was to:
- identify key issues related to pesticide risk reduction through good container management;
  - review existing regulatory and voluntary mechanisms which address these issues;
  - review existing technical and logistical mechanisms which address these issues;
  - consider barriers and opportunities;
  - consider the economics and practicability of the identified mechanisms; and
  - identify options for OECD, FAO and others to take further action on these issues.
9. The seminar was divided into two parts; a session devoted to presentations by governments and stakeholders, followed by a roundtable discussion among all participants.
10. Dr. Ralf Petzold, Federal Ministry of Consumer Protection, Food and Agriculture opened the seminar, welcomed participants and stressed the importance of good container management for reducing risk in agricultural pesticide use. His speech was followed by a presentation by the Chair on the context of the seminar, and the work of the OECD Working Group on Pesticide and the Risk Reduction Steering Group.
11. Copies of the presentations and papers developed for the seminar are attached as **Annex 2**.

## REVIEWING EXISTING CONTAINER MANAGEMENT SCHEMES (AGRICULTURAL USE)

12. Government representatives of Canada, Hungary and the United States presented the experiences with pesticide container collection and recycling schemes in their countries. In addition, a background paper was provided by Australia. Representatives of pesticide and recycling industries in Australia, Belgium, Brazil, France and Germany also presented their experiences. Representatives of FAO and PAN presented information on their work on container management in developing countries, with a particular focus on Africa. Brief summaries (organisation, logistics, types of containers collected, recycling/disposal options, financing, and policy context) of the reviewed container management schemes are presented below, supplemented by a summary of collection rates, charges/fees and costs in **Annex 3**.
13. A representative of CropLife International presented the findings of a recent worldwide survey of national associations on container management initiatives. Out of 56 respondents, 49 indicated that they have an established container management programme (beyond 'triple rinsing'), including schemes mandated by national legislation. The survey results showed that there are variations in the schemes. For example, dedicated recycling programmes are well established in North and South America, Australia and most of Western Europe. They are included in main-stream recycling in parts of Western Europe (particularly thermal recovery, although incineration is not always considered part of recycling by some definitions). In Africa and Asia, disposal by burying or burning (in line with local law and recommended practice) are common. There exist different financing mechanisms according to country. Pesticide industry is not the only player; most of the successful schemes are partnerships with national and regional or local governments and farmers groups. Final uses for collected plastics include material recycling into products (e.g. fence posts) as well as fuel (thermal recovery).

## **Australia**

### ***Who and How***

14. Australia's national container management scheme, "drumMUSTER", is a full stewardship programme developed by the industry, the National Association for Crop Production and Animal Health (Avcare Ltd.), the Veterinary Manufacturers and Distributors Association (VMDA), the National Farmers' Federation (NFF) and the Australian Local Government Association (ALGA). Launched in 1999, drumMUSTER is administered by an independent non-profit organisation, Agsafe Ltd., a wholly-owned subsidiary of Avcare Ltd. Agsafe has entered into 456 agreements with local governments which undertake the collections in their jurisdictions. Agsafe Ltd. also runs a collection programme for currently registered obsolete pesticides.

### ***Policy Context***

15. The drumMUSTER programme is an industry voluntary scheme. It is part of the country's waste management policy based on extended producer responsibilities and waste reduction at source to minimise the amount of packaging materials going to landfills. Under an Industry Waste Reduction Scheme (IWRS) MOU signed with programme stakeholders, agricultural and veterinary chemical manufacturers charge a levy of AUD 0.04 (EUR 0.024) per litre or per kilogram on most products sold in non-returnable containers to fund the drumMUSTER programme. Thus, the programme is ultimately paid for by farmers, in line with the polluter-pays principle. However, the agreement to charge the levy required a special authorisation by the Australian Competition and Consumer Commission, as it would be considered to be an uncompetitive practice.

### ***Results***

16. In 2003, drumMUSTER collected about 35% of total containers sold (primarily 20L containers), which deliver nearly 70% of the total volume of agvet chemicals sold in Australia. Between 1999 and April 2004, over 5 600 collections of cleaned one-way containers (2/3 were recyclable plastic, rest was steel drums) resulted in 4.85 million drums removed from farms, representing over 7 400 tons of waste diverted from landfills. Most of the recovered material is remanufactured in to recycled products, with a small share reconditioned for reuse as agvet chemical containers. The reported operating cost of the programme is EUR 759/ton.

## **Belgium**

### ***Who and how***

17. Phytofar-Recover administers Belgium's national container management scheme. It was established in 1997 by Phytofar, the Belgian Association of Crop Protection Industry. Members are invoiced annually to finance the container management scheme, in proportion to actual volume of packaging material they put on the market.

18. Phytofar-Recover handles primary packaging - packaging materials that are in direct contact with the product - exclusively for professional agricultural use. Annual collection period for industrial primary cans and packages from farmers and horticulturists take place from September to November, after the end of the spraying period. Rinsed containers are collected in transparent bags provided by Phytofar-Recover, separately for cans, and for paper and cardboard containers. The operation is divided for three types of pesticide users; i) farmers and horticulturists, ii) spraying companies, and iii) users of large barrels over 60L. Registered waste collectors are contracted for the collection of two types of used containers, hazardous and non-hazardous. The waste collectors are required to certify that the collected material is

incinerated at authorised facilities with energy recovery or recycled. Phytofar-Recover also runs a biannual collection and treatment of obsolete pesticides. It also runs a smaller scheme in Luxemburg.

### ***Policy Context***

19. In 1993, an eco-tax on containers of agricultural pesticides was introduced at EUR 0.124 (BEF 5) per packaged litre. However, an exemption was granted if a system of collection and treatment of empty containers were to be established, and the total collection reached the minimum of 80% of empty packing of pesticide products marketed during the year. This prompted Phytofar to establish a national container management scheme. However, this eco-tax was later abolished in 2003. The 1997 Agreement on Regional Co-operation Concerning the Prevention and the Management of Packaging Waste requires final user to hand in and those in charge of packaging to collect and recover packaging waste, in order to promote recycling and valorisation of the waste.

### ***Results***

20. In 2003, 483.36 tons of pesticide packages were collected, representing over 92% of the estimated total weight of containers put on the market that year. About 72.5% of the collected container was non-hazardous, and the rest hazardous. The programme cost in 2003 (not including obsolete pesticides) was EUR 704 229. Cost per kilogramme has declined over the years.

## **Brazil**

### ***Who and how***

21. In Brazil, the collection and recycling of used pesticide containers started as an industry initiative, which was later reinforced by the introduction of a new law requiring farmers, pesticide distributors and producers to return, collect and provide proper final destinations (recycling and incineration) for used containers. In 1993, Brazil's national pesticide industry association (ANDEF) entered into a voluntary agreement with the Agriculture Secretary of the state of Sao Paulo and the sugarcane planters' co-operative to launch a pilot container management scheme. Collected containers were taken to a small plastic recycling company. In the subsequent years, additional states joined hands with ANDEF to promote triple-rinsing and to establish collection centres in strategic locations. By the end of 2001, there were 30 such centres in Brazil. Meanwhile, recycling industry also grew. In December 2001, the National Institute of Containers (inpEV), a non-profit entity dedicated to managing the final destination process of empty pesticide packages, was established, bringing together Brazil's pesticide industry, distributors, and farmers.

### ***Policy Context***

22. In 2002, a law regulating the final destination of empty agrochemical containers entered into force. By then there was sufficient experience from the voluntary program of collection and disposal of containers begun earlier. The law requires farmers to practice triple-rinsing, return empty containers to receiving stations, and keep the vouchers of package delivery and invoice of product purchase. Distributors are required to indicate on invoices where the growers are to return the used containers, construct and manage receiving stations, and implement educational programmes for end users. Pesticide manufacturers are required to; provide transport, recycling or disposal services for empty packages collected at receiving stations; change labels to include information about triple-rinsing and returning used containers; and implement educational programmes for end users with distributors and government.

## **Results**

23. As of mid-2004, InpEV, in a joint programme with distributors, administers 260 collection centres. By the end of 2004, there will be about 300 centres, with the goal of eventually increasing the number to 350 – 400. In 1994 there was just one small plastic recycling facility. By the end of 2004, there will be 9 recycling plants in Brazil. The collection rate varies from state to state: 85% in the State of Bahia and 84.2% in Paraná, to 21% in Espírito Santo and less in some other states in May 2004. In 2003, the total collection was in the order of 7 800 tons, representing 35% of total packages sold. In 2004, 15 300 tons are expected to be collected, representing an improved collection rate of 65%. About 95% of what is sold can be recycled (plastic, metal, etc.) and the rest are incinerated. InpEV runs extensive awareness and education campaigns, including television advertisement and posters promoting triple-rinsing and taking back used containers to collection centres, with positive changes in farmers' behaviours.

## **Canada**

### ***Who and How***

24. In Canada, the most common type of agricultural pesticide containers is plastic 10-litre jugs. "Stewardship<sup>first</sup>", a voluntary pesticide container management scheme, is led by CropLife Canada, a national pesticide industry association representing manufacturers and distributors. It administers collection and recycling with matching funds from federal and provincial governments. Also, there is a levy charged to all pesticide manufacturers at CAD 0.54 (about USD 0.36) per container put on the market to fund the collection and recycling scheme.

25. Users take clean empty plastic containers to over 1 250 collection sites across Canada. Five contractors carry out the collection and shredding of used containers, which are then sent to three contractors for recycling. The granulated plastic is recycled into fence posts for agricultural use, highway guardrail posts, or used for energy. CropLife Canada also runs a parallel programme to address obsolete pesticides.

### ***Policy context***

26. Federal pesticide regulations require pesticide labels, for both agricultural and residential, to include directions on container management and disposal. For agricultural pesticides, the labels indicate that the container is recyclable and should be returned to a collection centre. For residential pesticides, labels instruct the container to be disposed of along with household waste. Federal and provincial waste regulations stipulate containers of some pesticides to be treated as hazardous wastes.

## **Results**

27. Canada's container management scheme collects and disposes of 658 tons annually. In 2003, 5.4 million containers were collected, adding up to over 55 million containers since 1989. Today, producers across Canada collect on a voluntary basis approximately 70% of all containers put on the market. The total annual programme cost is CAD 4 million (USD 2.9 million).

## **France**

### ***Who and How***

28. Adivalor, a voluntary organisation that administers container management in France, was established by the French pesticide industry association, le Union des Industries de la Protection des

Plantes (UIPP). Adivalor brings together agricultural organisations, pesticide manufacturers and retailers to collect and dispose of used pesticide containers in an environmentally responsible manner.

29. Responsibilities and costs are shared. Farmers are urged to properly rinse and store their containers and to bring them to 3 650 collection stations across France. Distributors are to communicate with their customers about how to dispose of their empty containers, and organise and control collection (bearing about 1/3 of the cost). Producers of crop protection products are responsible for the transport and recovery of the containers (bearing about 2/3 of the cost) in addition to providing scientific data regarding their products. Collected containers are incinerated, at an average cost of about EUR 480/ton, at cement kilns and incineration plants of hazardous waste management companies with energy recovery. Adivalor also administers a parallel programme addressing obsolete pesticides, for which public authorities contribute by providing subsidies (but not for the container management programme).

### ***Policy Context***

30. Regulations concerning crop protection product waste prohibit burying or burning, mixing of professional waste in household waste stream and, if hazardous, require disposal at authorised facilities. In France, rinseable pesticide containers (about 70% of packages marketed in France) are classified as hazardous waste by law, but Adivalor is negotiation with the French authorities for possible revision of the classification. If properly rinsed containers are to be classified as non-hazardous, this would help lower the cost of incineration significantly (to about EUR 100/tons or less).

### ***Results***

31. A national average collection rate of 25 % was achieved in 2003, with varying rates (5-50%) among localities. Adivalor plans to raise the national collection rate to 50 % by 2006. The scheme collected 1 840 tons of rigid plastic containers in 2003. Compared with the 2002 total of 1 300 tons, this represents a 41 % increase. However, the growth was lower than expected. One possible reason is the 10% decrease in the consumption of pesticides in 2003. In 2002, larger plastic containers holding 25 to 300 litres were collected by Adivalor for the first time. Previously, the scheme had only collected small plastic canisters with a maximum capacity of 25 litres. In 2003, the cost of the container management programme was EUR 2/kg of packaging material.

## **Germany**

### ***Who and How***

32. PAMIRA, a voluntary used pesticide container collection scheme in Germany, was established in 1996 by the Crop Protection, Pest Control and Fertilizer Association (IVA) following a few years of pilot projects led by the German crop protection industry. In January 2003, the management of PAMIRA was transferred from the Chemistry Business Promotion Corporation (CWFG) to the Corporation for the Recovery of Industrial and Commercial Plastic Packaging (RIGK), one of the four recovery companies already involved in PARIMA. IVA still maintains political oversight of PAMIRA. The industry finances the costs of PAMIRA according to the proportion of primary packaging material put on the German market. The distributors and retailers provide for the collection centres.

33. PAMIRA collects empty rinsed primary packages up to 60L in capacity. Farmers return rinsed primary packages, for free of charge, to 230 collection centres throughout Germany during a limited period (1-4 days) each year. At the collection centres, inspectors check returned containers to ensure that only properly rinsed ones enter the waste stream. If a container is deemed not sufficiently clean, it is not accepted for free (the farmer either comes back once properly cleaned, or pays a fee for depositing the unclean container). They are shredded and transported to reconditioning plants to prepare the material for

final disposal/thermal recovery in cement kilns, or for conversion into methanol. The plastic containers collected by PAMIRA are not recycled into new products as in Australia and Brazil.

### ***Policy Context***

34. The collection scheme of PAMIRA is fully in line with the 1998 Germany Packaging ordinance (Verpackungsverordnung). As for the design of pesticide containers, several EU regulations apply including; Directive 91/414 on placing pesticide products on the market, Dangerous Preparation Directive (for use of chemicals), Transport Legislation, Packaging and Packaging Waste Directive (package design and disposal), and Severo II (warehousing). Most plant protection products are classified as hazardous for transportation, which requires UN-approved primary packs. Thus, packaging design must take into account all logistical aspects for all modes of transport, warehousing, application and the route of disposal of used (and rinsed) primary packages. On the other hand, properly rinsed and inspected used pesticide containers in Germany are classified non-hazardous and are plastic packaging according to the European Waste Catalogue. Therefore, inspected empty containers are not classified under transport regulations.

### ***Results***

35. In 2003, PAMIRA processed and recycled about 1 547 tons packaging materials. This represents a national average return rate of 52%. The return rate varies across the country, ranging from 92% in Schleswig-Holstein to 13% in Rhineland-Palatinate. The cost of PAMIRA in 2003 was EUR 1 075/ton.

## **Hungary**

### ***Who and How***

36. During the 1970s and 1980s, Hungary had higher levels of pesticide consumption than today, generating 7 000 – 8 000 tons of packaging waste annually. There were routine collections and recycling of metal and glass pesticide containers. There was also a private enterprise which carried out the cleaning and recovery of plastic containers, but it was shut down in the mid-1980s due to economic problems. Hungary started again with newly defined goals and revised regulations that clearly define division of responsibilities. In 2003, CSEBER, a non-profit co-ordinating organisation for a national pesticide container management scheme was established by 20 pesticide producers. 90 collection centres have been established. All pesticide manufacturers are to join CSEBER, or to meet the regulatory requirements for container management alone. Members are charged collection fees of EUR 0.04/litre (for 2-25 litre containers), EUR 1.00/container (for 26-60 litre containers), EUR 2.00/container (for 61-250 litre containers), and EUR 3.50/container (for those over 250 litre). Collected packaging materials are transported by 3 contractors and incinerated at 3 facilities with energy recovery.

### ***Policy Context***

37. The Government Decree 94/2002 on Packaging Waste Management makes pesticide manufacturers and importers responsible for the collection, reuse and recovery of used pesticide containers through a designated co-ordinator, and sets the fees for used container recovery. The Ministerial Decree 103/2003 on Pesticide Packaging Waste requires farmers to practice triple-rinsing, and hand over clean used containers to designated collection sites. CSEBER is required to keep record of its collections.

### ***Results***

38. CSEBER's first collection in 2003 resulted in about one million containers (760 tons of plastic/glass/metal) collected, representing 45% of pesticide packaging material put on the Hungarian market. The 2000 Waste Management Act sets forth a target recovery rate of 50% of all packaging wastes

by July 2005. The programme cost in 2003 was EUR 720 000, most of which was for transport and recovery.

## USA

### *Who and How*

39. Established in 1992, Ag Container Recycling Council (ACRC), a non-profit organisation funded by CropLife America companies and seven other affiliate members, carries out a voluntary pesticide container collection and recycling scheme in the United States.

40. Final users bring rinsed empty plastic containers to collection sites, where they are inspected and accepted free of charge. Only non-refillable, high-density polyethylene (HDPE) plastic pesticide product containers for agricultural use are accepted by the ACRC. Four ACRC contractors grind the collected plastic containers into flakes, which are shipped to approved recyclers which produce non-consumer products such as field drain pipe, marine piling, etc. The ACRC recycling scheme is funded by member dues in proportion to the weight of plastic pesticide containers put on the US market, and determined by the total ACRC budget.

### *Policy context*

41. Federal pesticide regulations require labels to provide directions on container management and disposal. New regulations on container design and bulk containment are currently under consideration. Recycling and disposal of used pesticide containers are impacted by federal and state regulations that designate some pesticide containers as hazardous waste. State governments regulate open burning and landfilling of wastes, also affecting disposal options.

### *Results*

42. The US container recycling scheme collects about 7 million pounds (3 175 tons) or about 10 million containers annually. This represents roughly 28 % of plastic pesticide containers used by US farmers each year (35 million). Since 1993, over 65 million pounds (29 484 tons) or about 93 million containers have been recycled. Total annual programme cost is USD 3.9 million, of which over 80% is spent on container collections.

## **Developing Countries (especially Africa)**

### *General Problems*

43. Developing countries represent 25% of global pesticide use, but account for 50% of pesticide poisoning, and over 70% of pesticide related fatalities. 70% of pesticide products marketed in developing countries is substandard pesticides (produced by non-members of CropLife). Pesticides used in developing countries are often more toxic and contaminated than those in OECD countries. Developing countries face the challenge of having to deal with 100 000 tons of obsolete pesticides accumulated over the years.

44. The use and economic value of empty containers in developing countries often leads to theft, sale and illegal trafficking. One has to put this in the local context: in Mozambique one large drum costs USD 50, which is approximately one month's wage for a farm worker. Used pesticide containers are often smuggled illegally across borders for sale.

45. Poor education and information lead to poor management and handling on the part of users (and retailers). Typical problems include; i) incorrect storage of pesticide products (inside the home next to a

sleeping baby, under the house where children and livestock have easy access), ii) use of empty containers for water and food storage (e.g. an empty pesticide container being used to draw water from a well), and iii) inappropriate disposal (e.g. burning or burying obsolete pesticides and containers in open field or a shallow pit).

### *Problems with Container Management Initiatives*

46. Quantities of used containers may be too small to justify investment in major recycling schemes in developing country settings, which may not have existing usable facilities. Used container recovery and recycling schemes must account for the value of empty containers in developing countries.

### *Role of Governments, Industry, and OECD Countries*

47. Developing country governments need to legislate for recycling, as voluntary initiatives may not be sufficient. They could also help provide the means for recycling. If one country alone cannot achieve economies of scale, regional solutions may be considered and negotiated. For example, PAN UK initiated talks with pesticide distributors in Mozambique with view to the distributors collecting the obsolete product and containers back from retail outlets (when they are providing new stock), centralising the material and then disposing of it properly, possibly at an appropriate facility in South Africa if a local alternative is unavailable. Governments and industry need to stress education and awareness enhancement for users (e.g. triple-rinsing), and to remove the problem from users' hands. Industry should provide recyclable containers, and also provide the means to recycle. OECD countries can provide good models for container management (reuse, recycling and disposal), and assistance and support to pilot initiatives in developing countries.

### **The Home and Garden Sector (the UK)**

48. PAN UK presented their work in identifying container management problems and solutions in the home and garden sector in the UK. Knowing that 6 pesticide active ingredients were withdrawn in July 2003 representing 81 different products, they were concerned about **improper storage and disposal** of these withdrawn products and their containers. Often they remain in people's sheds indefinitely, or are disposed of inappropriately.

49. PAN UK conducted national and local surveys which helped build a greater understanding of the problem. The results of a survey carried out in a region that has facilities for the disposal of household hazardous chemicals showed that; 56% of the households have obsoletes and containers requiring disposal, 52% will store them indefinitely, 2.7% pour down the drain, 16% dispose along with other household waste, 74.7% would use a local authority disposal facility if they knew it existed, but **84% had no knowledge about the household chemical disposal facility of their local authority**.

50. PAN took the lead in providing a solution for the disposal of home and garden products and their containers. They worked with the national government (Pesticide Safety Directorate), local government authorities, industry (Crop Protection Association), and retailers. Special emphasis was placed on **raising awareness** of local authority employees who often did not know about the disposal service they provide, and retail workers so that they could better advise users about disposal options at the time of purchase. They profiled best case examples of disposal facilities to encourage more local authorities to provide the service. PAN has also created the first database of UK disposal facilities. This is a resource that allows the public to find the nearest disposal facility and encourages households to dispose of pesticides and their containers safely.

## OTHER STAKEHOLDER PERSPECTIVES

51. To complement the presentations from the perspectives of regulators and pesticide and recycling industries, representatives of farmers/growers and of NGOs contributed their views to the seminar.

### Farmers

52. From the perspective of a German farmer, **safe handling and equipment cleaning** are just as important as used container management in order to reduce risks from pesticide use. When switching between spraying on different crops, farmers clean the tank and spraying equipment before filling the system with a different pesticide formulation. Pesticide industry should consider **containers and application equipment designs** that are easier to clean and leave no washing residues. Examples include; smooth surface on the interior of tanks, shape of canisters that are easier to clean, and sprayers equipped with special washing nozzles or hand-held spray gun for cleaning of the system. Farmers also find rotation nozzle for canister washing to be very useful.

53. German farmers store empty canisters on their farms and bring them once a year to special collection centres. The PAMIRA programme is well known among farmers and distributors. It can be strengthened with **user awareness and education programmes**, for example, a “roundtable” to discuss problems of the system every couple of years.

### NGOs

54. NGOs can be involved in the identification of problems and the development of solutions for container management. Often NGOs can supplement the perspectives of the regulator, with anecdotes and case studies of ‘real life’ actions. In particular, NGOs can have access to information that government and industry cannot reach. They have skills in raising awareness of problems and solutions, can provide important capacity building to both local NGOs and government, and assist to build collaboration with stakeholders through their involvement in projects.

55. NGOs are interested in working on container management issues and can address those in both agriculture and home & garden sectors, and in developing and OECD countries.

## ROUNDTABLE DISCUSSION

56. After the presentations reviewing existing container management schemes and portraying perspectives of various stake holders, the floor was opened to all seminar participants for a roundtable discussion. They revisited the key characteristics of the container management schemes, logistical and regulatory frameworks and economic aspects. The participants identified several barriers and opportunities, and finally made recommendations for further work that would help further promote good container management in OECD countries as well as in developing countries.

### What is Container Management as a Risk Reduction Tool?

57. While the seminar’s main focus was the collection and recycling (the post consumption phase) of used agricultural pesticide containers of one-way or non-returnable types, the participants agreed that good container management for pesticide risk reduction involves the entire product life-cycle:

- i product formulation and container design;
- ii distribution;

- iii use, handling and cleaning (e.g. triple-rinsing of containers, application equipment);
- iv collection; and
- v re-use, recycling or disposal.

Phases i) and ii) are under the control of pesticide manufacturers and distributors, phase iii) farmers/users, and phases iv) and v) are handled by operators of container collection and recycling schemes. Key issues identified for each of these phases are summarised below.

### ***Design***

58. Pesticide manufacturers can make a difference in both pesticide formulation and container design that are safer and easier to handle and to clean. Container design must be appropriate depending not only on user and mode of application, but also on formulation. Container design contributes to risk reduction when they are designed for “pourability” to minimise dripping and splashing, and “cleanability” for easy residue removal and rinsing. Some formulation characteristics can minimise residues in containers. A study by the Packaging Expert Group of the European Crop Protection Association (ECPA) showed that triple-rinsing and pressure rinsing remove over 99.99% of the original pesticide content remaining in empty containers with superior “rinsability” and “drainability.” Concentrated formulas as well as water-soluble packages (often for solid formulations) and refillable/returnable/multi-trip containers lead to fewer used containers to dispose of. Containers should be suitable for ecological recycling and disposal (e.g. water-soluble bags), while also being robust to prevent leaks during transport and storage. One-way or non-returnable containers are the types most widely covered by the container management schemes.

### ***Handling/Cleaning***

59. Triple-rinsing by farmers and other users has been identified as a key for successful container collection and recovery schemes. Safe handling also includes proper storage, product preparation and application. Equipment-based solutions, such as sprayer design, also encourage safe handling and proper cleaning. Most of the container management schemes place emphasis on awareness-raising and training of users and retailers/dealers to promote safe handling and proper cleaning/triple-rinsing (e.g. Brazil, Australia).

### ***Collection***

60. Collection and removal of used containers (and obsolete pesticides) from farms and other users represent significant risk reduction. Especially in the developing country context, taking them away from users minimises exposure and unsafe re-use of containers for other purposes. The reviewed container management schemes carry out the collection through distributors and retailers (e.g. France), together with private waste management contractors (e.g. Belgium), as well as local governments (e.g. Australia, UK home and garden products).

### ***Recycling/Re-use***

61. Recycling (and valorisation) of used containers includes several options including energy/thermal recovery through incineration (e.g. Belgium, France, Germany) and new material/products (e.g. Australia, Brazil, Canada), depending on technical and economic feasibility. The majority of recycled products for the schemes reviewed by the seminar are plastics, made into fence posts, construction material, etc. Technical issues include safety (avoiding cross-contamination), requiring comparative risk assessment of different options. Economic considerations include relative material prices (virgin vs. secondary/recycled) as well as the cost of technology. Some of the container management schemes are involved in research and

development to explore safe low-cost technological options. Concerns were raised as to whether the recycled plastic market would be saturated if new product options are not identified. This is, however, a general problem for plastics recycling.

### ***Disposal***

62. The collected containers under most of the container management schemes reviewed by the seminar are reconditioned for reuse, recycled into new material/products, or incinerated with thermal recovery. However, the global survey by CropLife showed that disposal by burying or burning “in-line with local law and recommended practice” are common in parts of Africa and Asia. Some participants questioned whether such local law and practice are in line with the International Code of Conduct on the Distribution and Use of Pesticides (FAO). Most reviewed schemes address collection and disposal of obsolete pesticides (mostly through incineration) in parallel along with used containers. The participants agreed that used pesticide container management need to be put in the policy context of general waste management, i.e. minimising waste (source reduction) while maximising re-use and recycling/“valorisation” before disposal/destruction.

### **Regulatory Actions vs. Voluntary Schemes**

63. The reviewed schemes include those where participation in container management programmes is legally required for all players (e.g. Brazil, Hungary), those that are purely voluntary industry initiatives (e.g. Canada, France, USA), and those based on a mix of regulatory and voluntary actions (e.g. Australia, Belgium, Germany). The group debated whether pesticide container management should be mandatory or voluntary. There was a general agreement that in **OECD countries**, voluntary schemes work in many places, and mandatory approach can supplement if and where necessary. However, in **non-OECD countries**, regulation may be more necessary, supplemented by voluntary measures, economic incentives (e.g. to compensate for the perceived economic value of empty containers) and strong training and awareness raising programmes.

64. In this context, the group summarised who should act or take the lead in which area of container management (product design, labelling, transport, obsolete stock, waste disposal).

**Government:** legislate hazardous waste management; set standards (environmental, safety) and enforce them; make it mandatory for all stakeholders –if necessary- to contribute to container management schemes (especially to address the free-rider problem of non-paying manufactures and importers); introduce incentives (e.g. tax exemptions if participating in or contributing to container management schemes, support for industry research and development).

**Users:** comply with standards for use/handling of pesticide products and containers (triple-rinsing); voluntarily participate in container collection schemes (where not mandatory).

**Industry:** organise and finance (voluntary) container management schemes even where not legally required; fund research and development in improved product and container designs and new recycling options; actively promote user awareness and education.

**Distributors/retailers:** participate in (voluntary) measures to receive used containers brought back by users; participate in user awareness initiatives.

**NGOs:** provide information and awareness campaigns for users about sound use and management of containers.

65. The above summary brought out the importance for all stakeholders to play a role in user education and awareness campaigns, particularly NGOs.

### **Economic and Financial Aspects**

66. All schemes reviewed by the seminar are financed by the pesticide industry through a levy or contribution paid by pesticide manufacturers according to the share or amount of packaging material they introduce to the market. Distributors and retailers also contribute in some cases by financing collection centres/receiving units (e.g. Brazil, France). This is in line with the principle of extended producer responsibility. Ultimately, the cost is passed onto consumers through higher prices. One notable exception is the Australian scheme where a levy on containers is paid directly by farmers. This could be considered to be in line with the polluter-pays principle.

67. The container management operators are working to lower their operating costs. Transport and treatment account for an important share of operating cost for most schemes reviewed. The fees/charges and costs reported for the reviewed container management schemes are summarised and converted for comparison in **Annex 3**.

68. The seminar brought out an interesting fact that the incineration cost borne by the schemes varies significantly: some schemes have to pay to have the waste incinerated (e.g. France), while others can supply the container materials as fuels at no charge (e.g. Australia, although currently all used plastic containers are recycled for new products). The group agreed that further examination of the cost structures of container management schemes and prevailing costs of recycling and disposal options would be useful.

69. In developing countries, the value of used container must be kept in mind when designing any container management initiatives. Deposit-refund schemes would add an incentive for users to bring back used containers to collection sites.

### **Barriers**

70. The group identified the following issues as **barriers** to successful container management programmes. In turn, they signify what opportunities exist for improving container management schemes.

#### ***Classification as Hazardous Waste***

71. Whether empty used pesticide containers are classified as hazardous or not makes a substantial difference in logistics and costs of transport, recycling/valorisation and disposal. In Germany, the authorities and industry consider properly cleaned empty pesticide containers to be non-hazardous, while in France they are classified as hazardous. The French container management operator is currently in negotiation with the authorities to see if this barrier could be removed. If used containers are to be classified and handled as non-hazardous waste, risks need to be sufficiently minimised.

#### ***Free Riders and Lack of Funds***

72. Several container management operators cited the problem of free-riders who do not contribute to financing their schemes, posing a threat to the sustainability of their operations. Such free riders are reported to be generics producers. Enlisting non-contributing pesticide manufacturers into the scheme would increase financing and enable expanded coverage.

### ***Lack of Incentives***

73. Deposit-refund mechanism may be considered to provide incentive for users to bring back used containers to designated collection centres. Eco-tax exemption for pesticide manufacturers participating in collection and recycling programmes (e.g. Belgium) would give a strong incentive to organise or participate in such efforts.

### ***Lack of Government Support***

74. For container management schemes in some countries, lack of government support and acknowledgement was cited as barriers. Governments could help by regulating certain aspects of container managing (e.g. obligating users to practice triple rinsing, and manufacturers to participate in container management). Several initiatives have local governments as key partners providing logistical support (e.g. Australia, UK home & garden sector). Subsidies may be considered to help initiate container collection and recycling programmes until they achieve economies of scale.

### ***Lack of Capacity***

75. Especially in developing countries, lack of capacity and awareness among stakeholders (users, industry, distributors and regulators) was cited as a barrier to achieving pesticide risk reduction through container management initiatives. Technical assistance and training as well as information on what works/best practice are much needed.

### ***Complex Legal and Institutional Set-up***

76. Some container management scheme operators cited complexity in legal and institutional structure and “red-tape” as a barrier faced in their operations. Most of the reviewed schemes are partnerships involving a range of players, which is a key to success but can pose a challenge with institutional and contractual arrangements.

### ***High cost of Incineration***

77. Prevailing market structure and cost of incineration impact the operating cost and sustainability of container management schemes. Cost of incineration varies significantly by location and country, as discussed above (under Economic and Financial Aspects).

### **Opportunities**

78. The participants identified **opportunities** for improving container management and made some practical recommendations:

- combined management of containers and obsolete stocks (e.g. Belgium, France) can be a good example for developing countries;
- enlargement of the scheme to include empty containers of other agricultural products (e.g. fertilisers) could contribute to economies of scale (but low product prices make it difficult to justify the cost of collection and recycling schemes);
- using more of the existing/other waste management capacities where appropriate (e.g. join forces with other container/packaging material recycling operations or disposal facilities);
- setting realistic waste reduction goals and targets;

- developing clear performance indicators to measure the public benefit in real and transparent terms;
- developing new markets for recycled products; and
- more research and data gathering.

#### **NEXT STEPS**

The group considered what OECD and others could do to promote pesticide risk reduction through good container management. In this regard, the following areas were identified as possible next steps:

- i exchange information and experiences;
- ii publish information on good (bad) practice (for use by developing countries also);
- iii publish data on pesticide waste (i.e. container collection/management);
- iv study both ongoing waste management and good agricultural practices;
- v examine the economics of container management: cost structure, how to lower costs/raise efficiency.

79. The seminar participants agreed that good container management is an effective tool for pesticide risk reduction: it improves occupational health and environmental practices through reduced exposure, increased material recycling and energy recovery.

## ANNEX 1

## Participants List

**OECD Pesticides Programme  
Risk Reduction Seminar Series**

**Seminar on Risk Reduction through Good Container Management  
22 June 2004, Bonn**

<b>AUSTRALIA</b>	
<p><b>Sam Ponder</b> General Manager Agsafe Limited Level 4, AMP Tower 1 Hobart Place Canberra City, ACT 2601 (GPO Box 816, Canberra City, ACT 2601)</p>	<p>Tel: +61-2 6230 4799 Fax: +61-2 6230 6710 Web: <a href="http://www.agsafe.com.au">www.agsafe.com.au</a></p>
<b>BELGIUM</b>	
<p><b>Michel Volleman</b> Phytofar Recover Marie-Louise Square 49 B-1000 Brussels</p>	<p>Tel: +32.2.238.97.44 Fax: +32.2.238.97.57 Web: <a href="http://www.Phytofar.be">www.Phytofar.be</a></p>
<b>BRAZIL</b>	
<p><b>João Rando</b> Instituto Nacional de Processamento de Embalagens Vazias (inpEV) Rua Capitão Antonio Rosa - 376, 7 Andar 01443-010 São Paulo, SP</p>	<p>Tel: +11 3069 4000 Fax: +11 3061 5454 Web: <a href="http://www.inpev.org.br">www.inpev.org.br</a></p>
<b>CANADA</b>	
<p><b>Richard Aucoin</b> Chief Registrar Pest Management Regulatory Agency Health Canada 2720 Riverside Drive K1A 0K9 Ottawa</p>	<p>Ph: +1 613 736 3705 Fax: +1 613 736 3770</p>
<b>DENMARK</b>	
<p><b>Lene Gravesen</b> Chemicals Division Danish Environmental Protection Agency Strandgade 29 DK-1401 Copenhagen</p>	<p>Ph: +45-32 66 0573 Fax: +45-32 66 0479</p>

<b>FRANCE</b>	
<b>Pierre de Lépinau</b> A.D.I.VALOR 71, cours Albert Thomas 69447 LYON CEDEX 03	Tel: +33 4.72.68.93.87 Fax: +33 4.72.68.93.81 Web : <a href="http://www.adivalor.fr">www.adivalor.fr</a>
<b>GERMANY</b>	
<b>Wolfgang Zornbach (CHAIR)</b> Bundesministerium für Verbraucherschutz, Ernährung, und Landwirtschaft (BMVEL) Federal Ministry of Consumer Protection, Food and Agriculture Referat 518 (Pflanzenschutz -Plant Protection) Rochusstr. 1 53123 Bonn	Tel: +49-228 529 4317 Fax: +49-228 529 55 3595
<b>Ralf Petzold</b> Bundesministerium für Verbraucherschutz, Ernährung und Landwirtschaft Federal Ministry of Consumer Protection, Food and Agriculture Rochusstr. 1 D-53123 Bonn	Tel. +49 (0)228 529 35 27 Fax +49 (0)228 529 553595
<b>Georg vom Kolke</b> Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung Federal Ministry for Economic Cooperation and Development Postfach / P.O.Box 12 03 22 D-53045 Bonn	Tel. +49 (0) 228 535 3754 Fax +49 (0) 228 535 4754
<b>Karin Aden</b> Bundesamt für Verbraucherschutz und Lebensmittelsicherheit Federal Office for Consumer Protection and Food safety Messweg 11/12 D-38104 Braunschweig	Tel. +49 (0)531 299 3505 Fax +49 (0)531 299 3005
<b>Ulrich Roettger</b> GTZ Regional Central America Proyecto NOQ-GTZ Apartado Postal 8-4190 1000 San José, Costa Rica	Tel.: +506 2965715 Fax: +506 2320735

<b>Wolfgang Schimpf</b> GTZ Convention Project Chemical Safety Tulpenfeld 2 53113 Bonn	Tel.: +49 228 985 7031 Fax: +49 228 985 7018
<b>Heinrich Kemper</b> Deutscher Bauernverband e.V. Ohrser Straße 117 32791 Lage/Ohrsen	Tel. +49 (0) 5232 68935
<b>Detlef Döhnert</b> Senior Manager, Packaging and Labelling Agricultural Products BASF AG 67117 Limburgerhof	
<b>Thomas Neck</b> Industrieverband Agrar e.V. Pflanzenschutz - Wirtschaft Karlstr. 21 D-60329 Frankfurt	Tel.: +49(0)69 2556-1285 Fax +49(0)69 2556- 2285
<b>HUNGARY</b>	
<b>Zoltán Ocskó</b> Director Central Service for Plant Protection Budaörsi út 141-1485 1118 Budapest	Tel : 3613091040 Fax : 3613031074
<b>JAPAN</b>	
<b>Hitoshi Ono</b> Director, Planning and Strategy Office Agricultural Chemicals Inspection Station 2-772 Suzuki-Cho, Kodaira-shi Tokyo 187-0011	Tel : +81 423 83 2151 Fax : +81 423 85 3361
<b>Katsuya Sato</b> Agricultural Chemicals Administration Office Ministry of Agriculture, Forestry and Fisheries 1-2-1 Kasumigaseki, Chiyoda-ku, Tokyo 10-8950	Tel +81 (0)3-3501-3965 Fax +81 (0)3-3501-3774
<b>Yoichi Kamiya</b> Agricultural Chemicals Control Office, Water Environment Department, Ministry of Environment. 1-2-2 Kasumigaseki, Chiyoda-ku, Tokyo 100-8975	Tel:+81-3-5521-8323 Fax:+81-3-3501-2717

<b>SWITZERLAND</b>	
<b>Roland Von Arx</b> Swiss Agency for the Environment, Forests and Landscape 3003 Bern Switzerland	Tel :+41 31 322 93 37 Fax : +41 31 324 79 78
<b>René Bissig</b> Federal Office for Agriculture Research and Advisory Services Section Crop Protection Products Mattenhofstrasse 5 CH-3003 Bern	Tel: +41 31 323 11 34 Fax: +41 31 322 70 80
<b>EC</b>	
<b>Klaus Berend</b> Deputy Head of Unit Biotechnology & Pesticides Unit DG Environment European Commission Rue de Loi 200 Bu-5 2-151 1049 Brussels, Belgium	Tel : +32-2-2994860 Fax : +32-2-299 1067
<b>Eric Liegeois</b> Biotechnology & Pesticides Unit DG Environment European Commission Rue de Loi 200 Bu-5 2-158 1049 Brussels, Belgium	Tel: +32 2 2968616 Fax : +32-2-299 1067
<b>FAO</b>	
<b>Mark Davis</b> Coordinator and Chief Technical Advisor Obsolete Pesticides Plant Protection Service (AGPP) FAO Viale delle Terme di Caracalla 00100 Rome, Italy	Tel: +39 06 5705 5192 Fax: +39 06 5705 6347
<b>CROPLIFE</b>	
<b>Keith Jones</b> CropLife International 143 Avenue Louise Brussels 1050 Belgium	Tel: +32 2 542 0410 Fax: +32 2 542 0419
<b>Rick Holt</b> CropLife International 39 Hayloft Circle Wilmington, Delaware 19808, USA	Tel: +1 302 234 9475

<p><b>Margot Boergartz</b>  Safe Use Manager  Bayer Crop Science  40789 Monheim  Germany</p>	<p>Tel: +49 2173 38 3062</p>
<b>PAN</b>	
<p><b>Jane Worner</b>  Pesticide Action Network (PAN) UK  4 Eurolink Centre  49 Effra Road  LONDON SW2 1BZ  United Kingdom</p>	<p>Tel : + 44 (0) 20 7274 8895  Fax : + 44 (0) 20 7274 9084</p>
<b>OECD</b>	
<p><b>Kumi Kitamori</b>  Administrator  Pesticides Programme  Environment, Health and Safety Division  Environment Directorate, OECD  2 rue André-Pascal  Paris 75775 Cedex 16, France</p>	<p>Tel:+33 1 45 24 98 81  Fax: +33 1 45 24 16 75  Email: <a href="mailto:kumi.kitamori@oecd.org">kumi.kitamori@oecd.org</a></p>

## ANNEX 2

### Seminar Presentations and Papers

**(Available on the Pesticide Risk Reduction Steering Group Password Protected Web Page for the Risk Reduction through Good Container Management Seminar)**

#### **Government Experience and Perspectives**

Australian Background Paper: Container Management in Australia - Co-Regulation

Hungary: Zoltán Ocskó, Central Service for Plant Protection

United States & Canada: Richard Aucoin, PMRA

Developing Countries: Mark Davis, FAO

#### **Stakeholder Experience and Perspectives**

##### ***Pesticide Industry-global***

CropLife International: Keith Jones

##### ***Industry/Container Management Scheme Operators***

Germany: Detlef Dohnert, BASF AG

Brazil: João Rando, Instituto Nacional de Processamento de Embalagens Vazias (inpEV)

Belgium: Michel Volleman, PhytofarRecover

France: Pierre de Lépinau, Adivalor

Australia: Sam Ponder, Agsafe Ltd.

##### ***Farmers/Growers***

Germany: Heinrich Kemper

##### ***Public Interest***

PAN UK: Jane Worner

## AUSTRALIA Container Management – Co-Regulation

Authors:

**Claude Gauchat**, Executive Director (AVCARE) Locked Bag 916, CANBERRA, AUSTRALIA 2601  
**Ian Mortimer**, Senior Policy Advisor (Australian Government Department of Agriculture, Fisheries and Forestry) GPO Box 858, CANBERRA, AUSTRALIA 2601

### PURPOSE

---

Australia is a significant user of agricultural and veterinary (agvet) chemicals, and has demonstrated over the last 5 years that managing waste of both empty containers and unused agvet chemicals can be done effectively as a partnership between government and industry. The purpose of this paper is to briefly describe the national management framework for Australia's waste reduction strategies and the outcomes to date, with a view of offering practical input for policy development in other countries.

### POLICY DRIVERS FOR SUSTAINABLE CONTAINER MANAGEMENT

---

Australia's agricultural production area spans over 440 million hectares, and the 180,000 farmers are serviced by around 1,400 retail outlets. An average 110 million KG/L of agvet chemicals are sold annually, with over 1,760 products being actively marketed.

Given the scope of the potential waste problems both on and off the farm, the Australian Government identified back in 1990 that container management required industry action. Avcare, the National Association for Crop Production and Animal Health, took on the challenge by launching its own Container Management Strategy in 1992, which over time transformed into a full stewardship program '*drumMUSTER*<sup>1</sup>'. This program collects and disposes of all cleaned (triple-rinsed) one-way containers, targeting primarily the 20L container, which delivers nearly **70%** of the total volume of agvet chemicals sold in Australia.

The *drumMUSTER* program involves an arrangement between agricultural and veterinary chemical manufacturers to charge a levy on the purchase by farmers of these chemicals to fund a container collection scheme. The program was launched in 1999 under an Industry Waste Reduction Agreement (IWRA) with the Australian Government. The IWRA aims to reduce waste at source and reduce the weight of packaging that is going to landfill throughout Australia.

Avcare Limited, the Veterinary Manufacturers and Distributors Association, the National Farmers' Federation and the Australian Local Government Association developed the *drumMUSTER* program. The program is administered by an independent non-profit organisation, Agsafe Limited<sup>2</sup>. The program aims to provide an environmentally responsible way of collecting and disposing of rigid steel and plastic containers, which contain agvet chemicals.

The Australian Government believes that a scheme that protects the environment will benefit the public. The *drumMUSTER* program is achieving this aim by reducing the number of non-returnable chemical containers being disposed of as waste, and provides an environmentally responsible way of collecting and disposing of these containers.

---

<sup>1</sup> Avcare, National Farmers' Federation, Veterinary Manufacturers & Distributors' Association, Australia Local Government Association

<sup>2</sup> Fully-owned subsidiary of Avcare Limited

A levy of four cents per litre or kilogram on most products sold in non-returnable chemical containers is imposed by the manufacturers, and paid for by farmers. Without authorisation by the Australian Government, through the Australian Competition and Consumer Commission (ACCC), the agreement would have raised concerns under the competition provisions of the *Trade Practices Act 1974*.

The *Trade Practices Act 1974* prohibits certain forms of anti-competitive agreements, including agreements between competitors that limit their ability to deal with whom they choose or on the terms they choose (including price). The Australian Government accepts that the imposition of the levy does constitute a detriment; but considers that the impact on farmers is minimal given that the average percentage incurred by farmers on products is less than one per cent of the purchase price.

Authorisation provides immunity from court action under the Act arising from such agreements but can only be granted where the ACCC is satisfied that the public benefit flowing from the conduct outweighs any public detriment.

In addition to industry's efforts, the Australian Government sponsored a one-off collection and disposal scheme between 2000/02 for any unwanted chemicals at farm level. This initiative (ChemCollect) resulted in approximately 1,700 tonnes of chemical waste being delivered by farmers, thereby improving the position of both the health of the eco-system and protecting the food chain.

In order to prevent a repeat build-up of waste at farm level over time, the Australian Government mandated that industry manage the future collection and disposal of any unwanted registered agvet chemicals at regular intervals. As a result, a new program operating under the extended producer responsibility charter will be launched by industry as 'ChemClear<sup>®3</sup>', in July 2004. This program is funded by the manufacturing industry, and is cost-recoverable through the price of agvet chemicals, which also has the endorsement of the ACCC.

The Australian Pesticides and Veterinary Medicines Authority (APVMA), as the national regulator, also consider containers as part of any regulatory decision. Avcare is collaborating with the APVMA on the specifications for 'ideal containers', which can then be included in an Industry Guideline to promote the adoption of improved container design.

The ACCC undertakes an annual review of *drumMUSTER* (and in future, ChemClear<sup>®</sup>) to satisfy itself that the program is operating within the conditions of the authorisation, and that the program continues to deliver public benefit. This is a good example of a policy framework that delivers co-regulation with sound environmental and public benefits.

## **OUTCOMES FROM THE *drumMUSTER* PROGRAM**

---

Since the launch of the program a total of 436 commercial agreements have been signed between the program's administrator (Agsafe Limited) and the participating local governments who in turn, undertake the collections of cleaned drums in their jurisdictions. To April 2004, over 4,846 collections throughout Australia have resulted in the removal of 4.85 million drums from farms and surrounding areas, representing over 7,300 tonnes of waste successfully diverted from landfills. Almost all of this recovered material is remanufactured into new recycled products. In 2003, approximately 35% of total containers sold during the period were collected.

<sup>3</sup> Avcare, Veterinary Manufacturers & Distributors' Association, National Farmers' Federation

To achieve long-term sustainable environmental outcomes, waste reduction initiatives need to focus on both formulation and packaging innovations that deliver more dry formulations and returnable containers that are re-used. Part of the IWRA stipulates that up to 5% of the annual drum levy income is spent on research & development in search of more ideal containers and recycling options that can meet the environmental standards of tomorrow.

## **INSIGHTS INTO LEARNING CURVE AND CONCLUSIONS**

---

The results to date clearly indicate that the Government's waste reduction policy based on extended producer responsibilities and co-regulation does work and deliver tangible results. Important lessons have been learnt, and these are summarised as follows:

- Careful selection of Agreement Parties: sharing of the same vision, and ability to trust each other, are fundamental principles for any joint Government and Industry Agreement to succeed.
- Setting of realistic waste reduction goals and targets: sound market knowledge and understanding of stakeholder behaviour in your national market is required to be able to define and agree on realistic and achievable outcomes.
- Understanding of what constitutes success: all Parties need to agree and commit to a measurement process for public reporting purposes. Roles and duties should be defined and agreed to from the start of any program.
- Meticulous planning and regular independent reviews: 60% of management time should be spent on planning (including consultations) and 40% on execution. Managing expectations of all involved stakeholders is a major task that requires continuous attention.

One of the key challenges for the *drumMUSTER* program will be to develop clear performance indicators that can measure the public benefit in real and transparent terms, and then communicate accordingly. In this regard, application of the triple bottom-line approach by industry should facilitate the measurement of economic, environmental and community benefits of the program's already significant contribution to agricultural sustainability.

**HUNGARY**  
Zoltán Ocskó, Central Service for Plant Protection

OECD/RRSG



## GOOD PESTICIDE CONTAINER MANAGEMENT

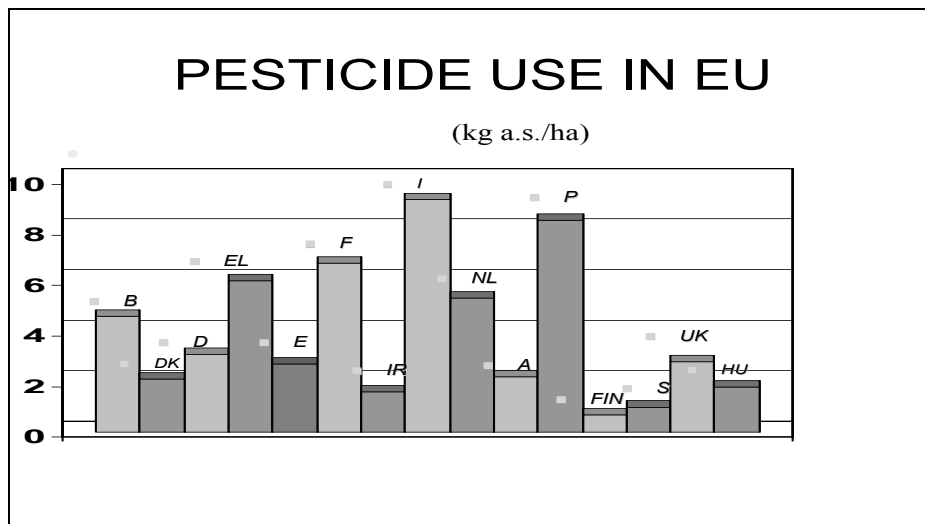
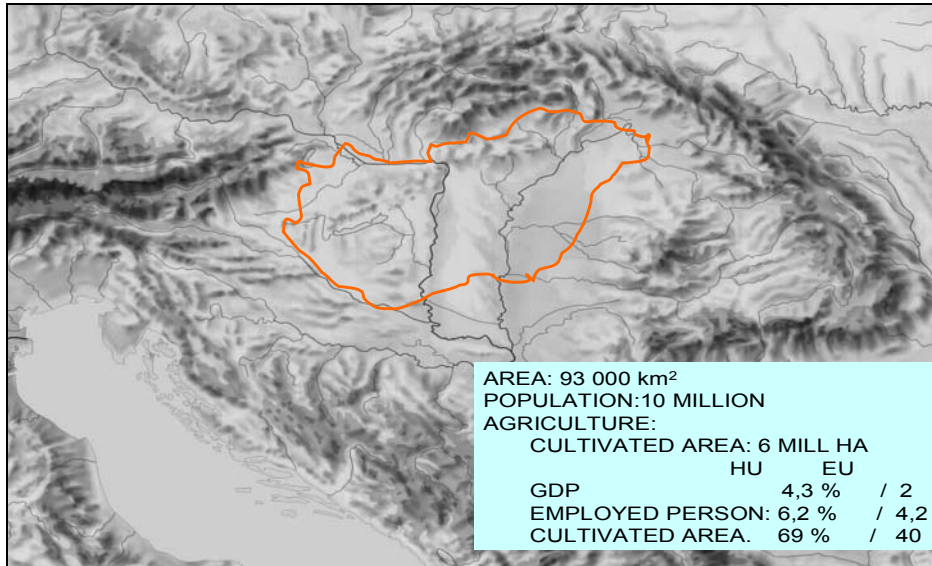
S E M I N A R  
B O N N  
22 June 2004

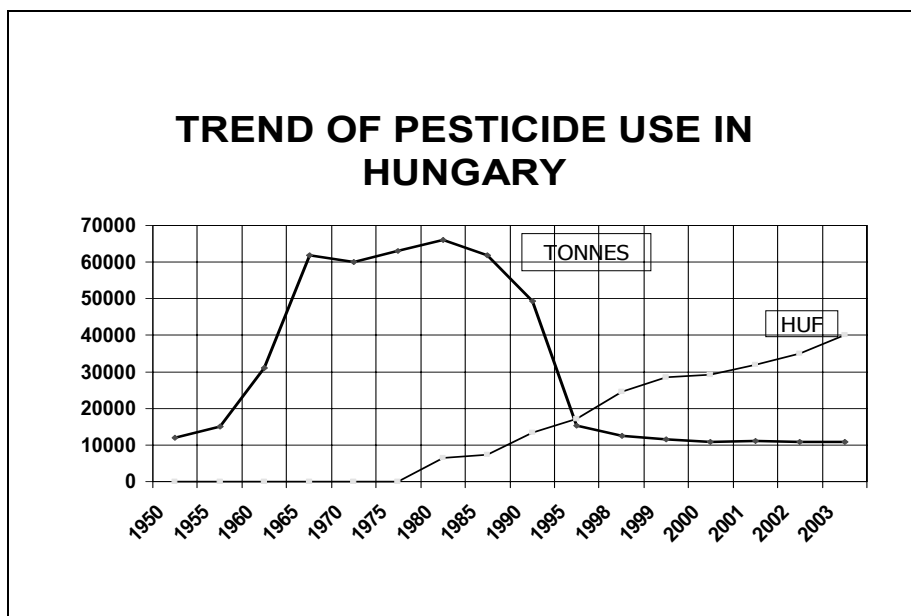
Zoltán Ocskó

Hungary

## TOPICS

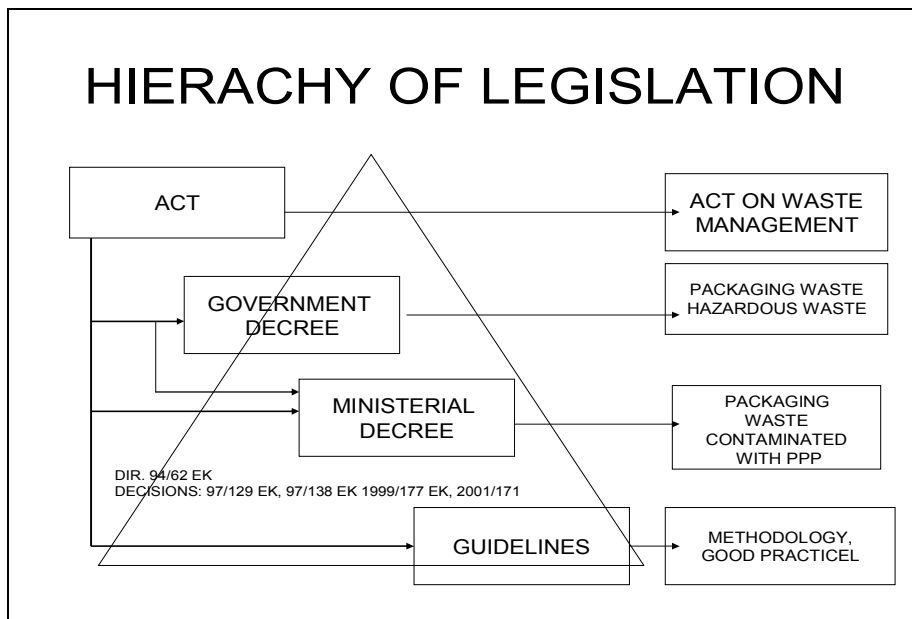
- COUNTRY DATA
- LEGAL BACKGROUND
- WASTE MANAGEMENT PRACTICE
- EXPERIENCES
- CONCLUSION





## PLANT PROTECTION

- INTERNATIONAL STANDARDS
- STRONG INSTITUTION
- PERMANENT CONTROL
- EDUCATION
- SECTORIAL COOPERATION



- ### PREVIOUS PRACTICE
- PESTICIDE USE IN 70' AND 80'
  - 7-8000 TONNES PACKAGING WASTE/Y
  - WHAT HAPPENED WITH THAT?
    - GLASS, METAL -RECYCLING
    - STORED FOR YEARS IN FARMS
    - PROGRAM FOR CLEANING AND RECOVERY OF PLASTIC – DEVECSER
    - PROFIT BASED ENTERPRISE
    - CLOSED DOWN

## START AGAIN

- DEFINE THE SPECIAL GOALS
- REVISE THE REGULATION
- DIVIDE THE RESPONSIBILITY
- CONTROL THE WHOLE PROCEDURE
- MOST IMPORTANT ELEMENTS
  - GENERAL RULES
  - SPECIAL RULES
  - FINANCE

## LEGAL BACKGROUND

- ACT ON WASTE MANAGEMENT (XLII/2000)
  - GENERAL RULES AND BASIC PRINCIPLES OF
    - *precaution manufacturer's responsibility, shared responsibility, duty of care, best available process, polluter pays, Proximity, regionalism, self-sufficiency, gradual progress, good example, cost effectiveness*
  - REQUIREMENTS, RESPONSIBILITIES AND OBLIGATIONS OF THE „PLAYERS“ /producer, user, distributor, authority, public, consumer, transporter,
  - ART. 56: „the following shall be achieved by 1 July of 2005  
minimum 50% of the packaging waste will be recovered“
  - ART 18 (1) The waste may be recovered by energetic utilisation (burning)
- GOVERNMENT DECREES
  - HAZARDOUS WASTE (98/2001)
    - LISTED- PESTICIDE
    - GENERAL RULES/COLLECTION/TREATMENT/STORAGE/RE-USE/DISPOSAL
    - EXCEPTION: DIFFERENT REGULATION OF OTHER RULES
  - PACKAGING WASTE MANAGEMENT (94/2002)
    - PRODUCER/COORDINATOR
- MINISTERIAL DECREES
  - PESTICIDE PACKAGING WASTE (103/2003 MARD)
  - RULES OF WASTE MANAGEMENT (MEW)

## GOVERNMENT DECREE 94/2002

- GENERAL RULES ON PACKAGING
- RETURN, REUSE AND RECOVERY OF PACKAGING WASTE IS THE RESPONSIBILITY OF PRODUCERS /IMPORTERS
- ALONE OR TOGETHER WITH OTHER PRODUCER OR BY ASSIGNING IT TO A CO-ORDINATING ORGANISATION (CO)
- CO SHOULD BE REGISTERED (NON PROFIT )
- REQUIRED CAPITAL 200 000 EUR
- FEE OF RECOVERY

2-25 L	26-60 L	61-250 L	<250 L
0,04 EUR/L	1 EUR/CONT.	2 EUR/CONT.	3,5 EUR/CONT.

## CO-ORDINATING ORG.

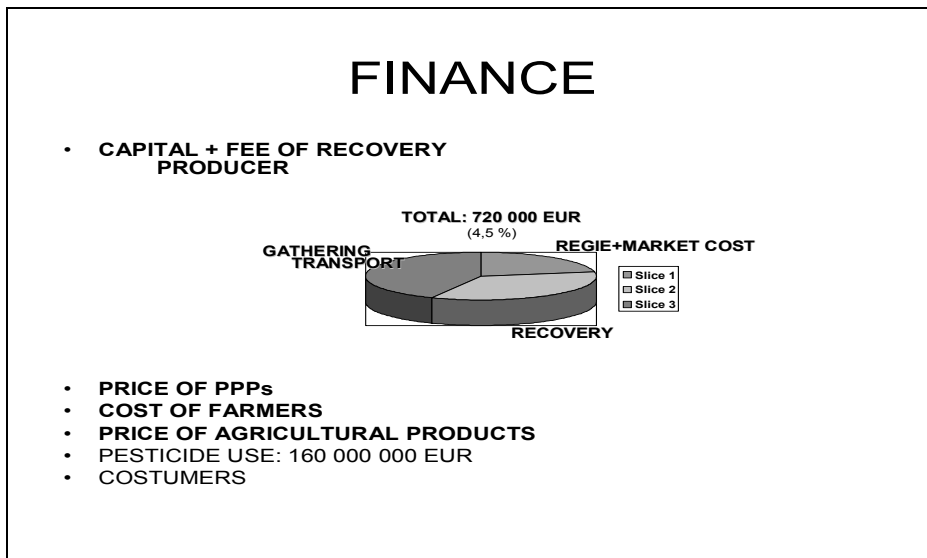
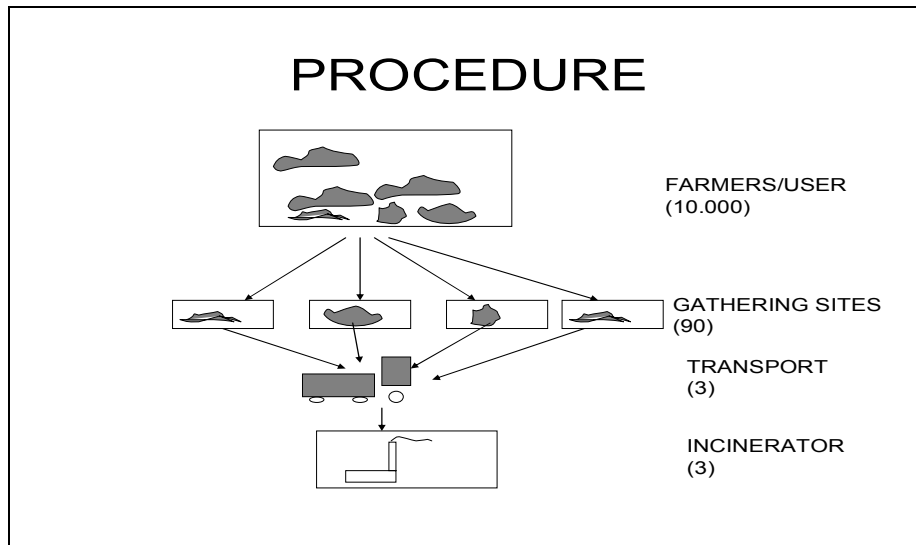
- ESTABLISHED IN 2003/CSEBER  
– NON PROFIT COMPANY (2 PERS.)
- 20 PRODUCER
- ESTABLISHMENT OF GATHERING PLACES (90)
- FIRST COLLECTION
- RESULTS IN 2003 (TONES)

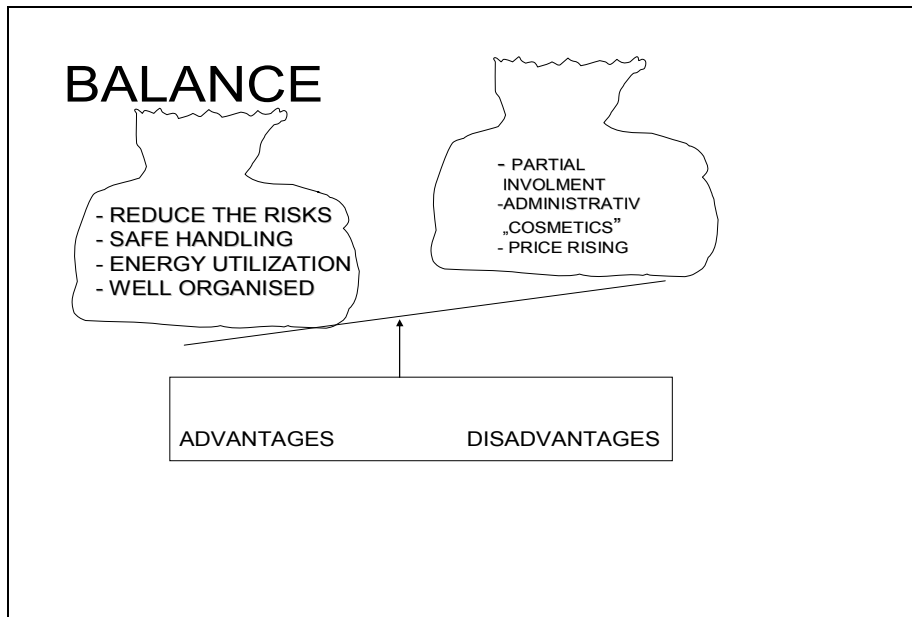
## MINISTERIAL DECREE

- CLEANING /RINSE 3X/
- PUBLIC USE LESS THAN 1 LITER/KG/MUNICIPAL WASTE
- STORAGE: MAX 1 YEAR
- OBLIGATION
  - FOR HANDING OVER
  - FOR TAKING OVER
  - FOR DISPOSING
    - REUSE/RECOVER/BURN/PLACE IN DEPO
  - FOR RECORDING
- 

## DATA

- PESTICIDE: 15-20 000 TONNES/YEAR
- PACKAGING WASTE: 10 % OF USE
- PACKAGING MATERIALS:
  - PLASTIC 70 %
  - GLASS 5 %
  - METAL 15 %
  - PAPER 8 %
  - WOOD 2 %
- LAST SURVEY (NGOs): 600 TONNES





## CONCLUSION

- SYSTEM COULD BE OPERATED
- IMPROVEMENT:
  - 70-80 % OF WASTE SHOULD BE DISPOSED
  - RECYCLING THE PLASTIC CONTAINER
  - AVAILABLE DATA SHOULD BE GATHERED
  - RESEARCH WOULD BE NECESSARY
  - INCENERATORS/CEMENT FACTORY
  - PROCEDURE SHOULD BE REVISED/SEPARATE TREATMENT
  - CHANGE THE FINANCING SYSTEM /FOUND
  - USE THE CAPACITY OF WASTE MANAGEMENT
  - REDUCE THE COSTS/FIND INTEREST

**UNITED STATES AND CANADA**  
Richard Aucoin, PMRA, and Anne Lindsay, U.S. EPA

**Pesticide Container Management  
in Canada and the United States**

**OECD Pesticide Risk Reduction  
Steering Group**

Richard Aucoin, Pest Management  
Regulatory Agency, Health Canada

Anne Lindsay, U.S. EPA

June 22, 2004

## Overview of Pesticide Container Management

- Reducing risk through container design, type and user handling practices
- U.S. approach
- Canadian approach
- Container recycling (U.S. & Canada)

## Risk Reduction – Design Handling - Emptying - Rinsing

- Container integrity prevents leaks during transport & storage
- “Pourability” to minimize dripping & splashing
- Compatibility with closed system transfer
- “Cleanability” – easy residue removal/rinsing
- Formulation characteristics – viscosity, etc.

## Fewer Containers to Dispose

- Concentrated formulas, low dose a.i.
- Water-soluble packaging – no rinsing
- Refillable/returnable – reduce disposal

e.g., a 415 liter container filled 2 X /yr for 5 years  
replaces over 400 10-liter jugs

## User Handling Practices

- Users incur risk handling containers by
  - Transporting and storing pesticides
  - Opening & emptying containers
  - Rinsing (if appropriate)
  - Disposing or recycling the containers
  - Disposing of pesticide if not empty
- Therefore, user handling practices impact container risk.

## U.S. Container Management

- Nonrefillable containers - 600 million
  - Ag: 114 million (28 M jugs; 22.5 M bags; 56 M WSP)
  - Industrial/commercial: 90.4 million
  - Residential: 400 million (200 M aerosols;  
124 M small (<3.8 L))
  
- Refillable containers – 1.31 million
  - Ag: 1.26 million (0.57 M liquids; 0.69 for dry)
  - Industrial/commercial: 0.05 million
  - Residential: 0

## U.S. Container Management <sup>(2)</sup> Federal Pesticide Regulations

- Label directions on container mgmt/disposal
  - Agricultural: rinse + disposal options
  - Residential: no rinse + disposal in trash
- Some pesticide-specific requirements
- Regulations on container design & bulk containment nearing finalization

## **U.S. Container Management** <sup>(3)</sup>

### Waste Regulations (Federal & State)

- Some pesticides are haz wastes – impacts disposal of containers & pesticides
- States can be more stringent – may limit disposal options
- State regs re open burning/landfills impact recycling rate

## **U.S. Container Management** <sup>(4)</sup>

### Pesticide Container Recycling

- Ag Container Recycling Council conducts container recycling
- ACRC: non-profit funded by CropLife America companies + 7 affiliate members

## U.S. Pesticide Disposal

- Users are responsible for pesticide disposal
- Most states have pesticide collection/ disposal programs for farmers & others: 30 million lbs (13,600 metric tons) disposed

## Canada Container Management Major Types of Containers

- Agricultural containers similar to U.S.
- Plastic jugs (10 liter) most common
- Refillable/returnables and WSP

**Canada Container Management (2)**  
**Federal Pesticide Regulations**

- Label directions on container mgmt/disposal for agricultural pesticides
  - Rinse & make unsuitable for further use
  - Emphatic recycling statement: “This is a recyclable container, and is to be disposed of at a container collection site.”
  
- Label directions on container mgmt/disposal for residential pesticides
  - May contain specific instructions
  - Dispose with household garbage

**Canada Container Management (3)**

**Waste Regulations (Federal & Provincial)**

- Some pesticides are haz wastes – impacts disposal of containers & pesticides
  
- Provinces are more involved/active in disposal and recycling than Federal government.

### **Canada Container Management** (4) Pesticide Container Recycling

- CropLife Canada conducts container collection and recycling

### **Canada Pesticide Disposal**

- CropLife Canada conducts (w. matching funds from fed or prov govt) pesticide collection/disposal for farmers: 658 metric tons (1.6 million lbs) disposed
- Have plans for an on-going disposal program

## U.S. Container Recycling

- Users take clean, empty plastic containers to site (voluntary)
- Containers are inspected
- 4 ACRC contractors grind into flakes
- Flakes shipped to approved recyclers
- Recycled into non-consumer products such as field drain pipe, marine pilings, etc.
- Safety evaluation of potential end uses

## U.S. Container Recycling <sup>(2)</sup>

- Collect about 7 million lbs annually  
(~ 10 million containers)
- Over 65 million lbs recycled since 1993  
(~ 93 million containers)
- Funded by member dues based on pounds of plastic “sold” in US market
- Total annual program cost: US \$3.9 million
- More than 80% is spent on cntr collections
- <http://www.acrecycle.org>

## Canada Container Recycling

- Users take clean, empty plastic containers to site (voluntary)
- Over 1,250 collection sites
- 5 CropLife Canada contractors collect & shred
- 3 CLC contractors recycle
- Recycled into farm fence posts, guard rail posts, and used for heat
- Safety studies on potential end uses

## Canada Container Recycling <sup>(2)</sup>

- 70% of containers are recycled
- Collected 5.4 million containers in 2003
- Over 55 million containers since 1989
- Funded by levy to all manufacturers based on packages shipped: \$0.54/cntr (US \$0.36/cntr)
- Total annual program cost: \$4 million (US \$2.9 million)
- 2/3 CropLife budget allocated to stewardship initiatives (including recycling & disposal)
- <http://www.croplife.ca> (stewardshipfirst)

## **Discussion Topics**

- **Optimal roles of all stakeholders in good container management?**  
Pesticide industry, users, fed. and state/prov. govt., safety educators, market forces, etc.
- **Who does/should pay for container recycling or disposal?**
- **Consider implications of packages other than plastic jugs to avoid replacing one problem with new ones.**  
E.g., refillables/returnables: more expensive, wear & tear on containers; pesticide contamination possible, potential for large spills from bulk storage.

**DEVELOPING COUNTRIES**  
Mark Davis, FAO

***Pesticide Container Management  
The Perspective from Developing  
Countries***

**Mark Davis, Food and  
Agriculture Organization**



**15 minutes on:**

- **The problem is.....**
- **We have recommended.....**
- **Getting there.....**



## **Pesticides in developing countries**

- **25% of global pesticide use**
- **50% of pesticide poisonings**
- **>70% of pesticide related fatalities**
- **100,000 tonnes of obsolete pesticides**
- **70% substandard pesticides**



## **Example**

- **Country X imports 10000 t pesticides/year**
- **3000t in 200l drums = 15,000 drums**
- **4000t in 5l canisters = 800,000 canisters**
- **1500t in 1l bottles = 1,500,000 bottles**
- **2000t dry products = 1,040,000 bags**

**3,355,000 containers/year**

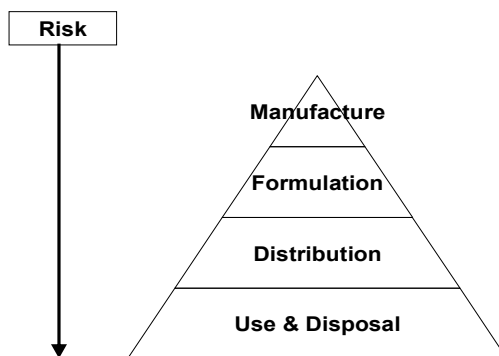


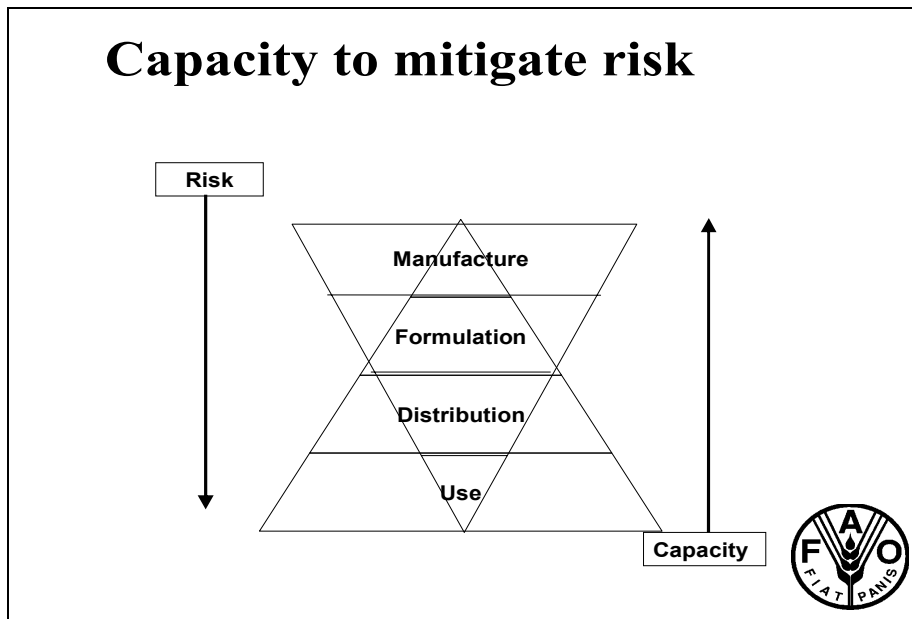
## Container hazards

- **Even rinsed containers contain some residues (>350,000µg (Carter 2001));**
- **Pesticides used in developing countries are often more toxic and contaminated than in OECD countries;**
- **Empty containers have value**
- **Poor education & information = Poor management**



## Life cycle risk management





- ## Developing countries
- **Quantities may be too small to justify investment in major recycling schemes**
  - **May not have existing usable facilities**
  - **Schemes must account for value of containers**
- 

## We have recommended...

- **OECD**
- **FAO**
- **Industry**

Aid agencies are encouraged to assist recipient countries with ... local refund systems for empty containers of pesticides used by farmers  
...Availability of facilities to dispose of empty containers  
(DAC Guidelines No6)



## We have recommended...

- **OECD**
- **FAO**
- **Industry**

Governments, with the help of .... Should inventory ...used containers, establish and implement an action plan for their disposal...

....prevent the accumulation of



## We have recommended...

- **OECD**
- **FAO**
- **Industry**

Governments, local authorities, suppliers and users should collaborate to establish recycling and safe disposal channels for empty pesticide containers.

Containers should not be burned or buried  
(FAO Disposal Series No7)



## We have recommended...

- **OECD**
- **FAO**
- **Industry**

...the Plant Science Industry also recognises the need to manage packaging to meet other environmental goals, namely to reduce the amount, reuse where possible and to recycle waste.



## **What to do**

### **USERS**

- Educate to triple rinse
- Remove the problem from users hands



## **What to do**

### **SUPPLIERS**

- Provide recyclable containers
- Provide the means to recycle



## **What to do**

### **GOVERNMENTS**

- Legislate for recycling
- Provide the means for recycling
- Regional solutions might be best



## **What to do**

### **OECD COUNTRIES**

- Provide good models for container management
- Support management schemes




## **HELP NEEDED**

- **Good models of container reuse, recycling & disposal**
- **Assistance in piloting schemes in developing countries**
- **An author for new guidelines**



**CROPLIFE INTERNATIONAL**  
Keith Jones



Representing the Plant Science Industry

OECD RRSR Workshop June 2004

**Container Management:Global Overview**

**Keith A. Jones, Manager**  
**Stewardship & Sustainable Agriculture**




**Who we are**

**The Plant Science Industry invents, develops, manufactures and sells products and services designed to improve the global production of food, feed, fibre and other useful products in a sustainable way.**

**The Industry performs this mission through the use of biology, chemistry, biotechnology, plant breeding and other techniques while following the highest ethics and standards and providing safeguards for human health and the environment.**

**The Industry pursues transparency in its business activities by addressing concerns of all stakeholders – including customers, regulatory agencies and NGOs. The industry embraces the free and open market philosophy supported by the international community.**


PAG September 1999



**A network of Associations in 88 countries...**


28 national associations

26 national associations



18 national associations

14 national associations



**... driven by 8 core companies**

**syngenta**

**BASF**


**Dow AgroSciences**

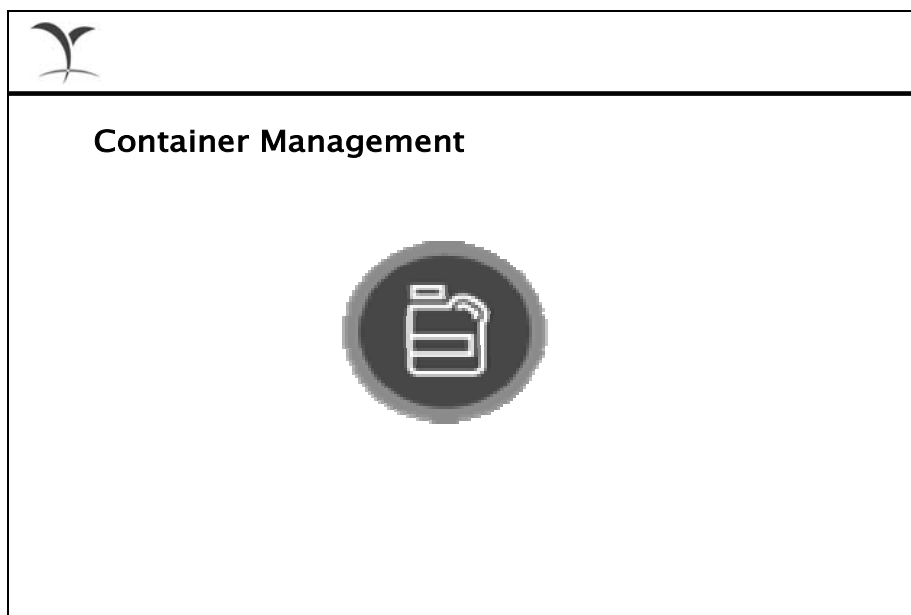
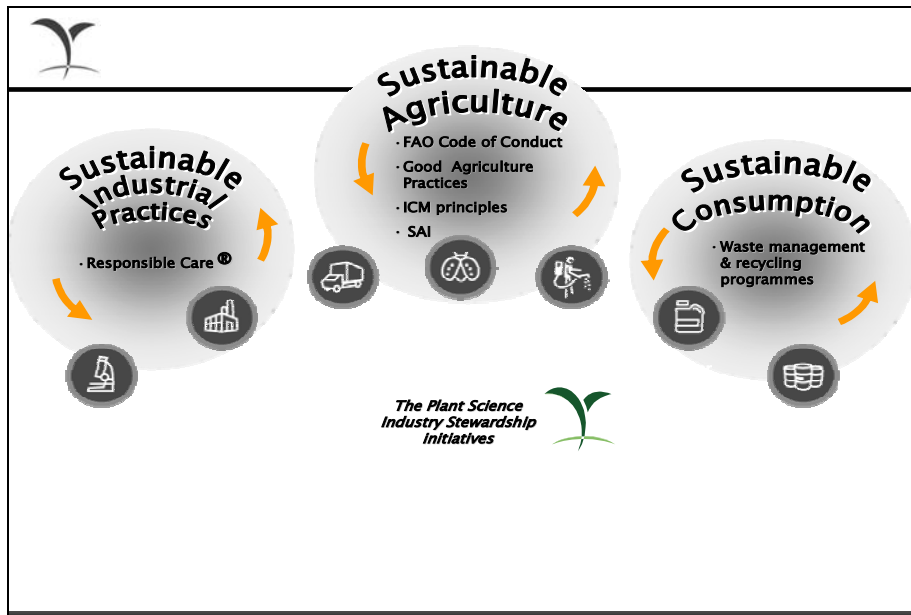
**SUMITOMO CHEMICAL**

**DU PONT**

**MONSANTO**

**FMC**








### **Strategy**

- **Promote, partnership with other stakeholders, the proper management of pesticide containers**
  - **Design**
  - **Handling**
  - **Disposal**




### **Design**

- **Robust – do not break or leak during normal use**
- **Practical – suited for conditions of use (size, material)**
- **Recyclable – where possible (including thermal recovery)**

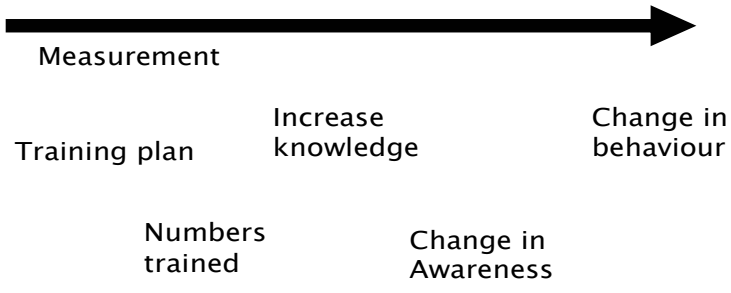


**Handling**

- **Training of Trainers, Dealers, Farmers in proper handling and responsible use ('Safe Use Initiative'). To date more that 2.5 million directly trained**
- **'Triple rinsing' is the minimum standard – removes more than 99.99% of product residue**
- **Proper storage, product preparation, application and disposal**



**Overall aim: Change in behaviour**










Measurement

Training plan      Increase knowledge      Change in behaviour

Numbers trained      Change in Awareness



### Stewardship Publications: Training Guidelines

							
<b>Publication date</b>	07/04	07/04	10/04	10/04	02/05	02/05	12/04
<b>Languages</b>	E, F, A	E, F, A	E, F, A	E, F, A	E, F, A	E, F, A	E, F, A
<b>Total Number</b>	10000	10000	10000	10000	10000	10000	10000
<b>Estimated Cost</b>	15000	15000	15000	15000	15000	15000	15000

E= English

F= French

A= Arabic



### Stewardship tools

- IPM the way forward – the detailed report
- Water matters – collection of case studies
- Creating opportunities for Sustainable agriculture
- Industry Guide on FAO Code of Conduct
- A Shared Vision – Safe Use in Latin America
- Regional publications (e.g. ECPA)
- Sustainable Agriculture video



## Disposal

- **Recycling/recovery is the ultimate goal**  
*But it is not always practical or possible in all countries/regions*
- **Needs to be practical solutions based on local needs**



## Global overview of activities

### Survey of all CropLife national associations:

- **56 responses: 49 out of 56 have an established management programme (beyond 'triple rinsing') – includes schemes covered by national legislation**
- **Variation of schemes**
  - **Dedicated recycling well established in Nth and Sth America, Australia and most of western Europe**
  - **Inclusion in 'main-stream' recycling in parts of western Europe (thermal recovery)**
  - **Destruction (bury/burning – in-line with local law and recommended practice) in Africa and Asia**



### Recycling/recovery

- No single 'model system'
- Different financing mechanisms according to country
- Plant Science Industry are not the only players
  - Most successful programmes are partnerships
- Uses for plastic – fuel, thermal recovery, products (e.g. fence posts), *but will 'the market' become saturated? Need for research on more uses, including comparative risk assessment of different options*



### Examples

- Costa Rica – partnership with GTZ; 12.5% plastic 45% metal collected, thermal recovery
- Canada – Voluntary association-led scheme, 70% plastic collected (55m containers since 1989), recycled (e.g. fence posts) and thermal recovery
- Sri Lanka – local schemes for collection of (glass) containers
- South Africa – Government scheme; association initiative for thermal recovery programme for plastics
- Germany – detailed presentation by Dr Detlef Döhnert

**GERMANY**  
Detlef Dohnert, BASF AG

**Stakeholder Experience and Perspectives**  
**Recycling/Disposal Industry**

**Introduction**

The disposal of plant protection product (PPP) containers starts well ahead of their design. The development of a packaging system initiates as soon as the formulation (i. e. the product intended for sale) has been defined. The chemical nature of the active ingredient triggers the possible types of formulation.

The formulation determines the packaging material. The mode of application influences the design of the packaging system.

Modern packaging systems for plant protection products (PPP's) are a compromise of:

- Technical requirements
- Economic requirements
- Ecological requirements

with maximum safety to mankind, environment and to the product. Safety means complying with legal requirements, such as

- EU Directive 91/414 (placing products in the market)
- Dangerous Preparation Directive (use of chemicals)
- Transport Legislation
- Packaging, Packaging Waste Directive (pack design and disposal)
- Essential Requirements (pack design)
- Seveso II (warehousing)

In Europe alone there is or will be a wide range of legislation and initiatives in place which directly and/or indirectly influence the use and other aspects of PPP's, e.g. 6EAP (6th Environmental Action Programme of the EU); most of this is now or will be transposed into national legislation.

The major portion of the PPP's are classified as hazardous for transportation which requires UN approved primary packs and/or combination packs.

Given this framework, it is obvious that modern packaging development has to also cover logistic aspects (for all modes of transport), warehousing, the mode of application and the route of disposal of empty (rinsed) primary packs. It therefore governs the pack of a PPP from cradle to grave.

In addition, the crop protection industry has agreed on voluntary guidelines concerning the development of packaging systems:

- GIFAP Recommendations for one-way Agrochemical Packaging Design – Criteria for Liquids and Solids (GIFAP monograph, 1994)
- Guidelines for Specifying the Shelf Life of Plant Protection Products which also provides testing conditions for packaging systems (GIFAP monograph no. 17, 1993)
- Container management strategy (CMS)

These documents reflect the respective elements of the Code of Conduct; they can be downloaded from the ECPA PTEG website [www.ecpa.be](http://www.ecpa.be)

**Packaging options**

Basically, there are three options for packaging systems available:

- One way (single trip) systems (STCs)
- Multi trip (returnable) systems (MTCs)
- Systems where the packaging system is part of the formulation, e.g. water soluble bags (WSBs)

WSBs look ideal because no (possibly contaminated) primary packaging material is left. However, it has to meet the following critical issues:

- Reasonably fast cold water solubility
- Long term storage stability also at low temperatures (brittleness)
- Protection against moisture from outside (which may require outer packs with water barriers)
- Solubility of WSBs may be adversely influenced by other products present in the mixing tank
- The primary packaging material enters the environment
- “Digital” dosing (by fixed pack sizes)

To summarize, water soluble packaging is a delicate system suitable for limited options, mainly for solid PPP's.

Multi trip container systems (MTCs) are returnables with or without closed transfer systems (CTS). They are mainly used for liquid PPP's. MTCs are especially suitable under the following conditions:

- Short distances between user and refiller
- Many trips per life time
- Big container volumes
- Suitability of the PPP for packaging and storing in MTC systems (critical in case of multiphase formulations)

However, the application of PPP's (in Europe) is characterized by the following issues:

- Seasonal application with limited application windows
- Long distances between user and refiller
- Small container sizes (for PPP's in Europe the MTCs have usually volumes 50 l or less)

To avoid cross contamination, special transfer and dosing equipment is required. Cleaning of the MTCs after each cycle is recommended. Examples of MTC systems in the market are:

- Link Pack (for liquid PPP's)
- Ecomatic system (for liquid PPP's)
- Sure fill systems (for granular PPP's)
- Lock and Load (for granular PPP's)
- Calixin MTC system (Latin-America)
- Farmpack (for liquid PPP's)

Due to cost and ecological implications, up to now STCs are the preferred packaging option for PPPs. Among them containers made of HD-PE with and without barriers (approx. 80 % of the total primary packaging material) and

PET are the most common ones. Their volumes range from 0.1 l to 10 l (5 kg) as part of combination packs. The advantages are:

- Low primary packaging mass
- Easy and convenient to handle
- Easy to rinse
- no potential of cross contamination

Above 10 l, 5 kg free standing primary packs are in use. Typical primary packs for solid PPP's are bag in box systems, FFS sachets and rigid plastic containers.

## **Adhesion and migration**

A key issue of modern PPP container design is their excellent drainability and rinsability, usually better than 99.99 % (or a residue level below 0.01 %) of the original content. This holds both for triple rinsing and (integrated) pressure rinsing. An internal ECPA study, conducted in 1993 and revised in 2002, plus additional reports published by various independent laboratories prove that residues of <0.01 % are standard after pressure or triple rinsing.

However, the amount of residue does not only result from adhesion to container walls, but also from migration into container walls. To keep migration at a minimum, suitable barrier materials are in use, such as polyamide (PA), poly-ethylenevinylalcohol (EVOH), and fluorination of HD-PE containers. Internal migration studies, compiled in 2002 by the members of the Packaging Expert Group (PEG) of the European Crop Protection Association (ECPA), showed that the migration rate of active ingredients into container walls of investigated packs is usually well below 200 ppm (in relation to the mass of the primary packaging material). Migrated moieties are trapped inside the resin; they are virtually immobilized in the walls of the empty container.

Analytical data of actual material collected by PAMIRA (Packmittelrücknahme Agro) show for more than 50 moieties adhesion values <50 ppb (at container walls).

These very low residue values clearly indicate that the risk of hazard arising from empty rinsed PPP packs has been nullified. Therefore, rinsed PPP packs can be considered non hazardous.

## **The German Collection Scheme PAMIRA**

In 1991, the German Crop Protection industry conducted the first local pilot collection scheme. PAMIRA was established nationwide in 1996 jointly by industry and by the distribution channel as a non profit making organisation. It is totally financed by the agro industry. Since 2003 PAMIRA has operated under the roof of RIGK to take advantage of possible synergies. PAMIRA collects all empty rinsed primary packs up to 60 l in volume. The rinsed packs have to be returned open; closures are collected separately. From a legal point of view, PAMIRA is fully in line with the German Packaging ordinance (Verpackungsverordnung) of June 12 1991, amended in January 1998.

The farmer can return rinsed primary packs free of charge. The container label carries the PAMIRA logo to show that the container is covered by the collection system.

Given the relatively small amount of packaging waste and the seasonality of the agro business it is obvious that the collection scheme can only be operated for a limited time per year.

Currently, there are 230 collection points at retailers all over Germany. At the collection points, independent staff visually inspect returned containers to ensure that only properly rinsed ones enter the collection scheme. They issue a certificate, which the farmer, although not required at the moment, can use to document the amount of returned packaging waste. This certificate is also part of the official documentation on collected packs.

The packs are collected in skips which are then covered. At certain hubs the containers are shredded and transported to reconditioning plants to prepare the material for final disposal. In Germany there are currently two routes of final disposal in place:

- Thermal recovery in cement kilns
- Conversion into methanol at Schwarze Pumpe

The collection of empty PPP packs is part of the customer relationship management (CRM) at retailer level.

## **Classification of rinsed empty PPP packs**

As already pointed out, there may be residues in the collected post consumer resins (PCRs) caused by very small amounts of adhesion at and migration into container walls. It is the common understanding of the German authorities and the industry that rinsing of empty packs nullifies the risk of any hazard arising from such PCRs. Therefore, according to the European waste catalogue (EWC) the rinsed packs are categorized under 15 01 02, i. e. packs made of plastic. According to the transport regulation ADR/RID (road and rail) these PCRs are not classified for transport because the risk has been nullified.

Although ADR/RID does not require the removal of labels, it may be useful to provide an explanatory statement with the transport documents. German authorities and the industry share this view.

### **Cost of PAMIRA**

The total cost of the PAMIRA collection scheme covers

- the cost of operation of the collection site
- the cost of labour for inspectors
- all transport costs from collection site to certain hubs, shredding or compacting of empty packs
- all additional transport costs from hubs to the point of final disposal
- all costs associated with the final disposal of the PCRs
- all administration costs and costs for public relations
- all costs of an independent trustees

PAMIRA is financed by the companies according to the proportion of primary packaging material brought into the German market by each member company. Each member provides a detailed record of primary packs brought into the German market.

### **Summary**

Returning empty packs to the retailer is convenient for and accepted by the farmers. The approval by independent inspectors at collection points ensures that only clean packs enter the collection stream. This leads to the classification of PCRs as non hazardous. The concept of controlled loops is part of the principle of responsible care as established by the agro industry. Collection rates well above 50% at affordable cost reflect the broad acceptance of all participants involved.

**Presentation**

**Risk Reduction through Good Container Management**

**PAMIRA, Germany**

Agricultural Products

**Dr. Detlef Döhnert, BASF AG**

**Meeting of the OECD Pesticide Risk Reduction Steering Group, Bonn, June 22, 2004**

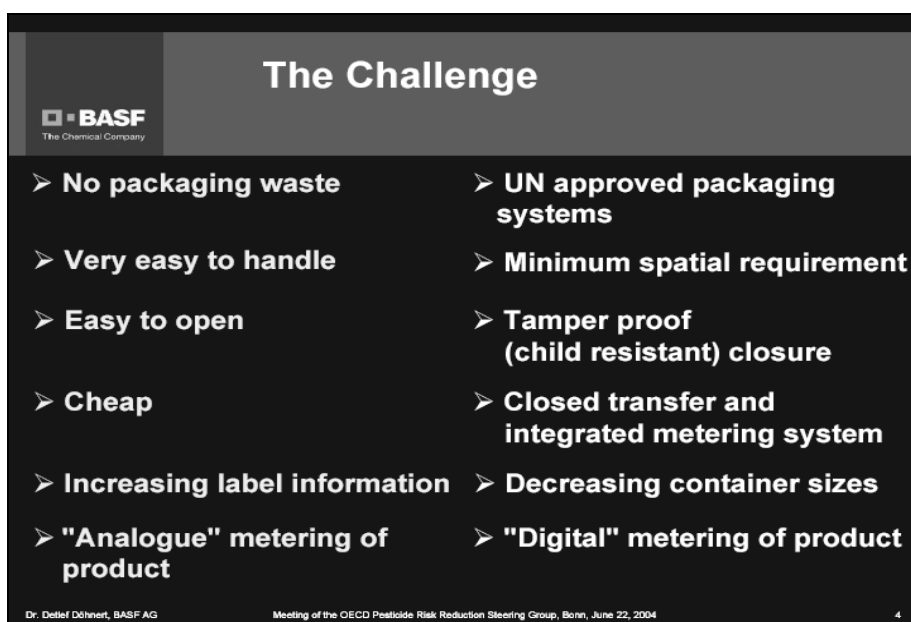
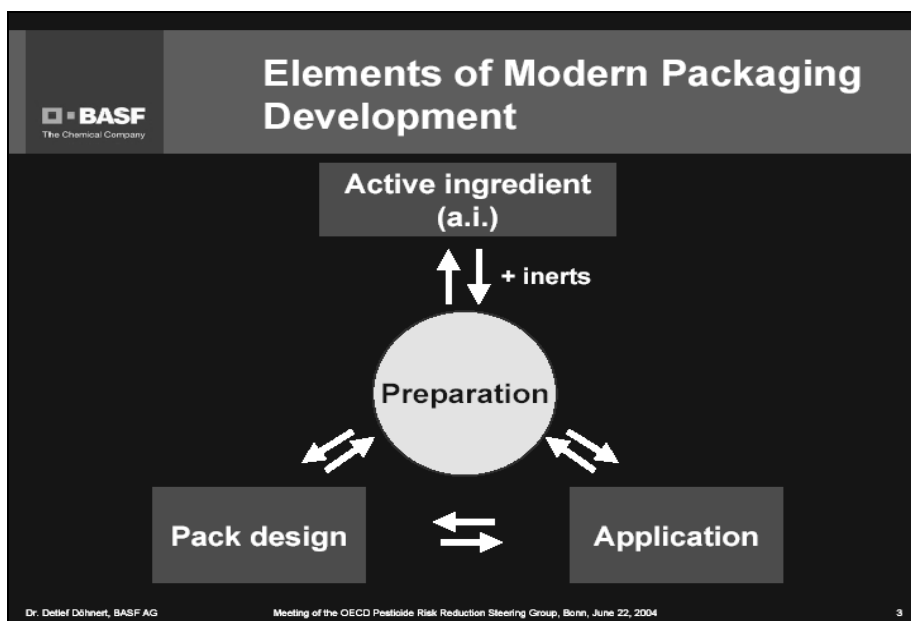
**BASF**  
The Chemical Company

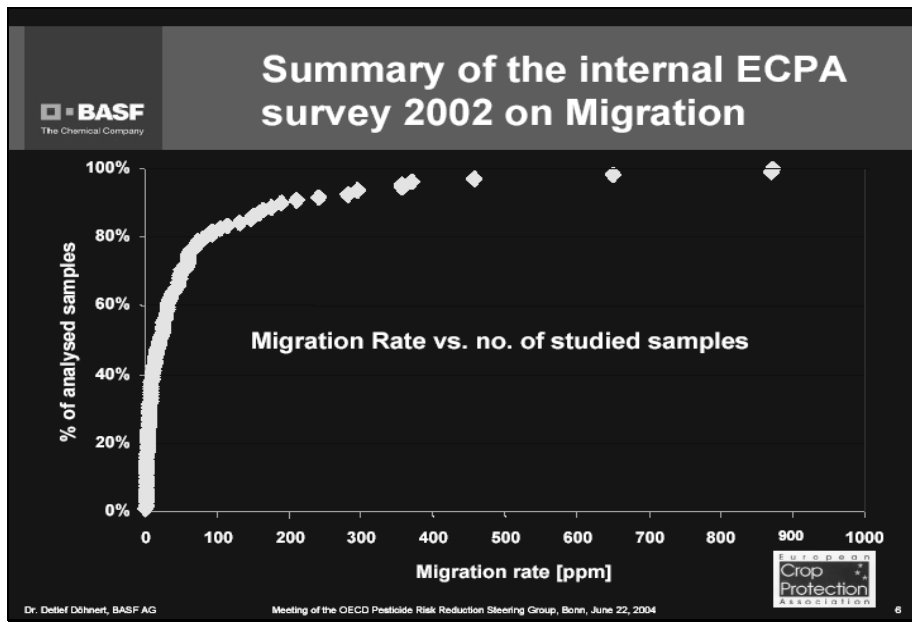
**Agenda**

**BASF**  
The Chemical Company

- 1. Introduction**
  - The Challenge
  - The Packaging Compromise
- 2. From Cradle to Grave**
  - Development of Packaging Systems (Options)
  - Adhesion and Migration
- 3. The German Collection Scheme PAMIRA**
  - Example: Germany
  - Organisation of the German Scheme (PAMIRA)
  - Classification of empty rinsed Packs
  - Cost
- 4. Summary**

Dr. Detlef Döhnert, BASF AG Meeting of the OECD Pesticide Risk Reduction Steering Group, Bonn, June 22, 2004 2





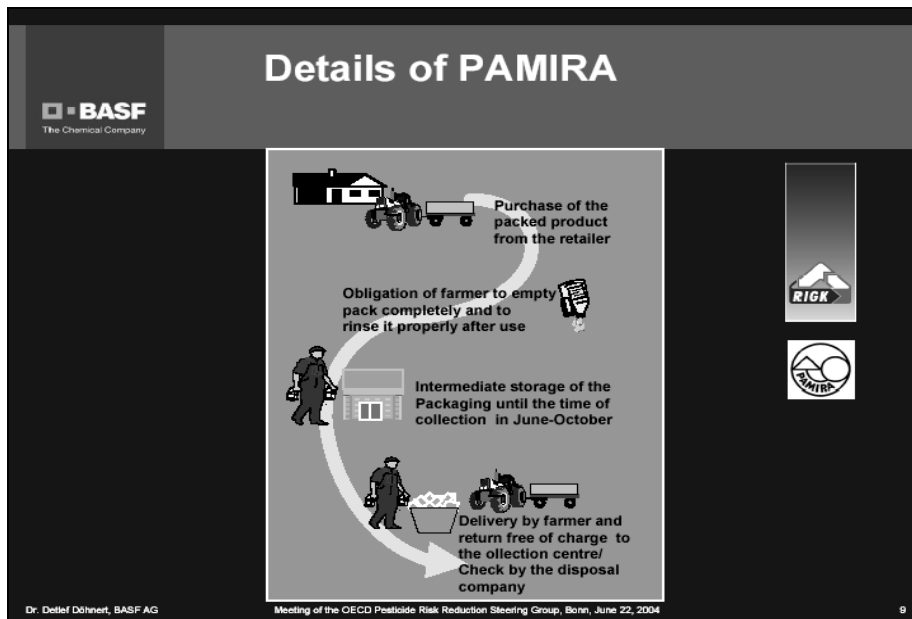
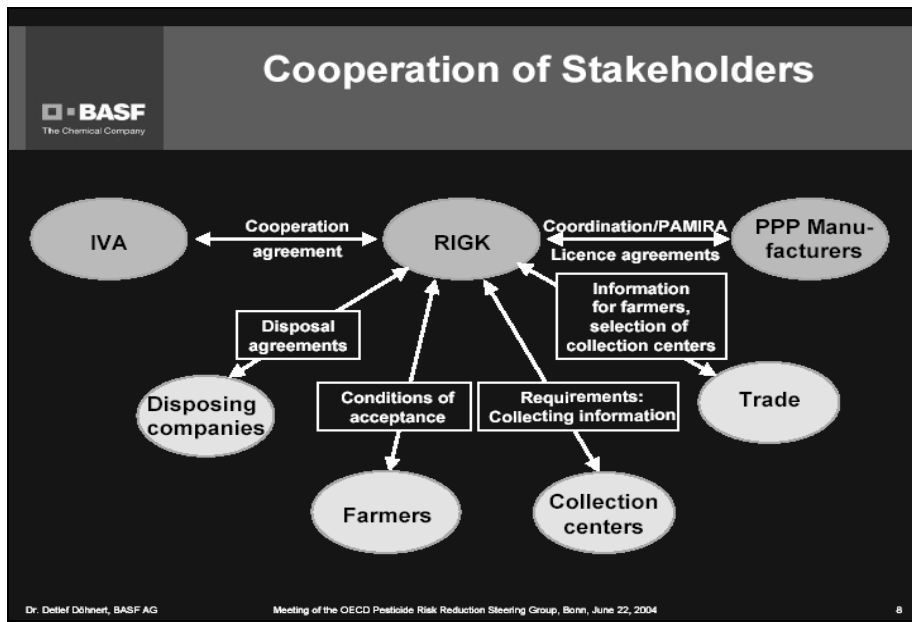
### The German Collection Scheme

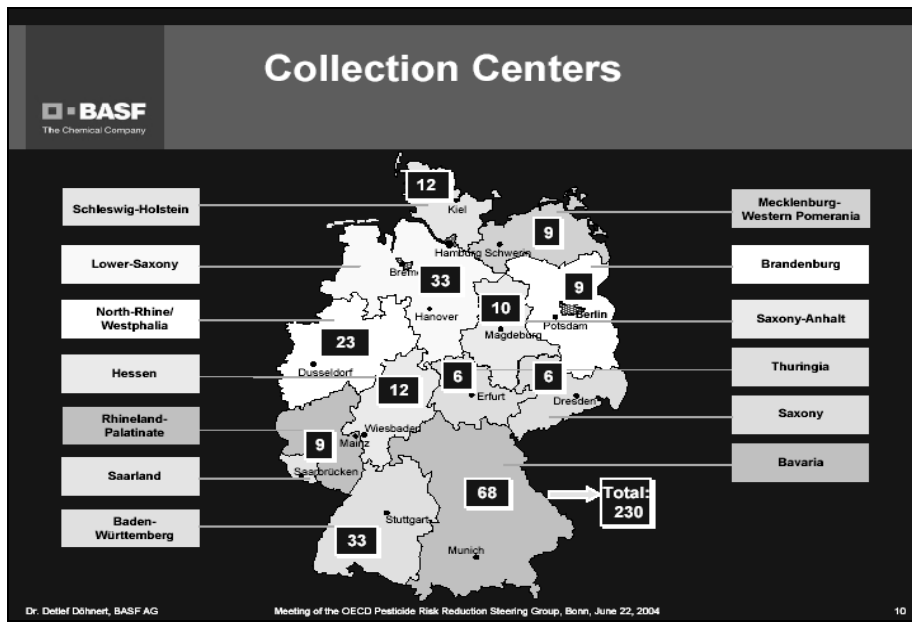
® = a registered trademark of IVA (Copyright)

**Packmittel- Rücknahme Agrar**


**The Collection and Disposal Scheme of Industry and Wholesalers for Agrochemical Packaging in Germany**

Dr. Detlef Döhner, BASF AG Meeting of the OECD Pesticide Risk Reduction Steering Group, Bonn, June 22, 2004






## At Collection Centers/2




**BASF**  
The Chemical Company

### At Collection Centers/2



**Packaging must be emptied of residues and properly rinsed**  
**Control by collection centre**




**The Taking Back Protocol is important for Documentation and Transparency**

Dr. Detlef Döhner, BASF AG

Meeting of the OECD Pesticide Risk Reduction Steering Group, Bonn, June 22, 2004

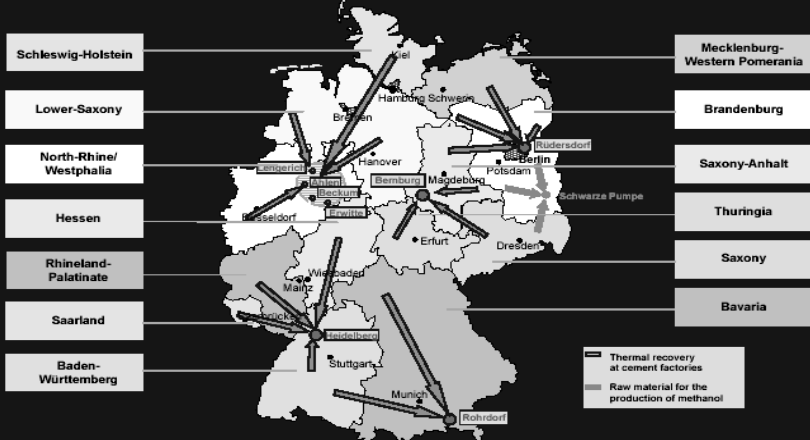
12

## Route of final Disposal



**BASF**  
The Chemical Company

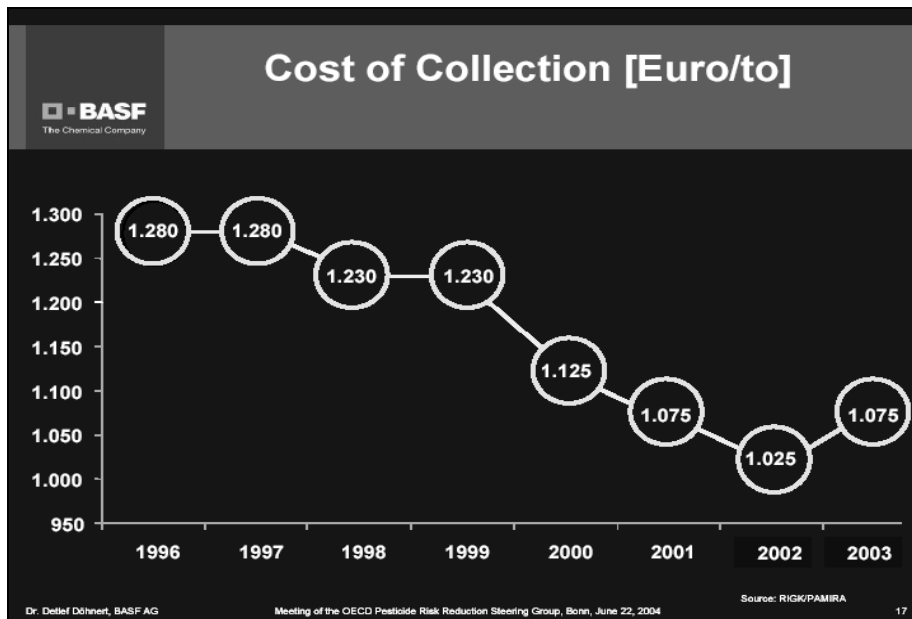
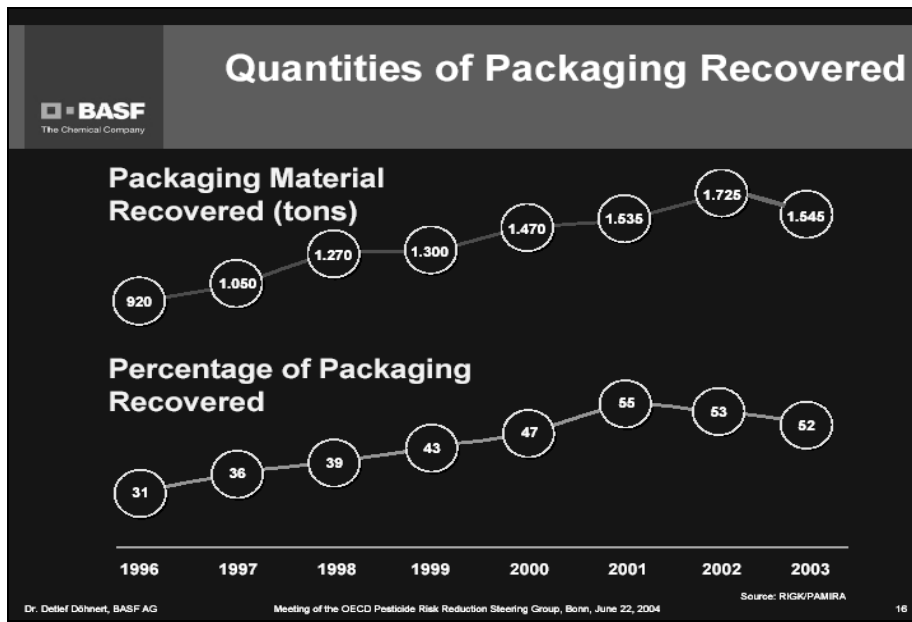
### Route of final Disposal



Dr. Detlef Döhner, BASF AG

Meeting of the OECD Pesticide Risk Reduction Steering Group, Bonn, June 22, 2004

15



**BRAZIL**

João Rando, Instituto Nacional de Processamento de Embalagens Vazias (inpEV)

This presentation can be viewed at the following web-site:

[http://www.oecd.org/document/60/0,2340,en\\_2649\\_34383\\_2073276\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/60/0,2340,en_2649_34383_2073276_1_1_1_1,00.html)

**BELGIUM**

Michel Volleman, PhytofarRecover

1. Our name is **Phytofar-Recover** and, a few years ago, **Phytofar** (the Belgian Association of Crop Protection Industry) created us. These two associations are part of **Fedichem**, the Belgian Federation of Chemicals Industries, located in Brussels near the European Berlaymont.

**Phytofar** and **Phytofar-Recover** are active in the domain of the crop care that respects environment and human health. **Phytofar** is in contact with the Belgian authorities and is perfectly informed about laws and rules' changes.

## L a w

***ECOTAXATION (16/07/93)***

*€ 1,24 per litre (max € 12,50 per package)*

*plant protection products for professional use,*

*cancelled on 01/07/'03 for plant protection*

*products*

***AGREEMENT ON REGIONAL COOPERATION CONCERNING PREVENTION AND  
MANAGEMENT OF PACKAGE WASTE (21/01/97).***

**Phytofar** defends carefully the rights of its members. Within **Phytofar** different study groups are active in many domains:

- *Communication.*
- *Economical and social questions.*
- *Distribution, with subdivision packaging.*
- *Garden.*
- *Regulation.*

Each group is composed of experts of the crop protection industry who help the **Phytofar** team with all the different topics and files.

Which Packages

---

CROP PROTECTION PRODUCTS for professional use	
Class A	All packages
Class B, concentrated	> 0,5L
Class B, diluted	> 5L
Not classified, concentrated	> 0,5L
Not classified, diluted	> 5L

**Phytofar** was, as we already said, early informed about the eco-taxation law and decided with its members to create a new association to avoid those taxes.

*Phytofar-Recover was created and is now, a few years later, known and respected.*

2. In 1996, a pilot project took place because the authorities required the recovery and the processing of 60% of the empty packages (of crop protection products) put on the market during that year.

**Phytofar** demonstrated perfectly that the pesticide industry was able to accomplish this mission.

In 1997 the association had more time to organize the collection of empty primary cans and packages and worked out a new system.

An executive manager, named Roger Rymen, who is now retired since December 2000, was chosen at the beginning of the year 97, to organize, structure and defend the new organisation. He took also care of the communication aspect.

In the beginning the administration tasks were accomplished by a temporary secretary.

Today, **Phytofar-Recover** has a full-time secretary and a manager who are supervised by a president. The association has a board of directors, a supervisory board and a general meeting.

Any problem, decision or result has to be approved by the directors who belong to the big crop protection companies. Some of them represent the wholesalers.

3. From the beginning of September till the end of November we organize the collection and the processing of the industrial primary cans and packages of the farmers and the horticulturists. We normally

collect after the spraying period. We finish the campaign in the fruit culture area where they spray normally up to end October.

Our system is divided in three parts:

- One that concerns the farmers and horticulturists (professional small users).
- One that concerns the spraying companies.
- And a last one that concerns the users of barrels of more than 60L.

In Belgium, the processing of that kind of empty cans, barrels, paper and cardboard has to respect very strict rules and we have to work with an authorized and registered collector to collect and treat those waste.

Regarding the first two parts of our system, we don't have a great number of suppliers able to manage such a quantity of waste in our country.

We ask those collectors to →

- ⇒ *Fulfil our planning.*
- ⇒ *Furnish working teams all around the country.*
- ⇒ *Furnish enough containers to stock and evacuate the waste.*
- ⇒ *Certificate that the collection material is incinerated and valorised thanks to the recuperation of energy in an authorized waste processing installation.*

Each team includes an inspector and one or two workmen who are on the site from 8.30 a.m. till 4.30 p.m. and gather the Phytifar-Recover bags, full of empty cans, from the personally invited farmers. Then they control the cleanliness of the cans, and decide which of the two containers –one for the non-hazardous fraction and the second for the hazardous fraction- will receive the presented bags.

After being controlled, the farmer or horticulturist receives on real time an attestation for the quantity of Phytifar-Recover bags she or he returned. That document has to be kept with the invoices of pesticides.

Most of the collection sites are situated in the warehouses of the wholesalers or retailers.

They assure the availability of a place where the team can work in good conditions (if possible under cover to be protected from rain and wind). When necessary, they also provide some help.

The same collector takes care of the loading for the spraying companies (second part of our system) and he loads immediately on their own company sites.

To collect this part, we use a compress truck, which is followed if necessary, by a truck for the hazardous waste.

The third part is confided to **BIFFA** that collects directly on the users' company sites and delivers immediately the waste to the shredder, that has a cryogenic separation system. With this procedure the barrels are reduced to the size of a bankcard. After that the solid and liquid fractions are separated.

The solid residue will be exposed to an extra low temperature that offers the possibility to separate the hard components: iron metals, non-iron metals and plastics.

In 1997, 2000 and in 2003, we also collected no longer authorized for use, old and unemployed products.

All the electronic data information we received during September, October, November and December are analysed.

Therefore we ask the producers and holders of identifications to give us their statistics concerning the amount of packages they put on the market in last year.

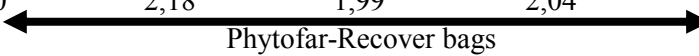
In February we finalise our figures and elaborate the budget for next year. After asking the export-data from the Ministry of Agriculture we are able to define our results. After the board of directors' approval, the authorities, the regional departments and industrial waste managers are informed about our results.

#### 4. Results

##### Number of farmers and horticulturists who bring waste

99	00	01	02	03
21.793	19.677	18.899	19.963	20.743

##### In average they brought

99	00	01	02	03
1,90	2,18	1,99	2,04	1,93
				
		20,20 kg	21,37 kg	18,72 kg

##### Belgium costs

Costs (in €)

Non-dangerous waste → **0,7269** Per kilo

Dangerous waste → **1,7480** Per kilo

Total farmers' campaign → **0,9178** Per kilo

<u>Detail</u>	<i>N.D.W.</i>	<i>D.W.</i>
Transport	0,2777	0,6792
Processing	0,1748	0,7944
Staff	0,2744	0,2744
	<b>0,7269</b>	<b>1,7480</b>

**For** **20.743** Farmers and horticulturists

**40.004** *Phytofar-Recover bags*

**To collect** **388.360** **Kg**

**315.680** **Kg N.D.W.**

**72.680** **Kg D.W.**

**Average per farmer** **10** *Kg / bag*

**1,93** *Bag*

**18,72** *Kg*

**On**

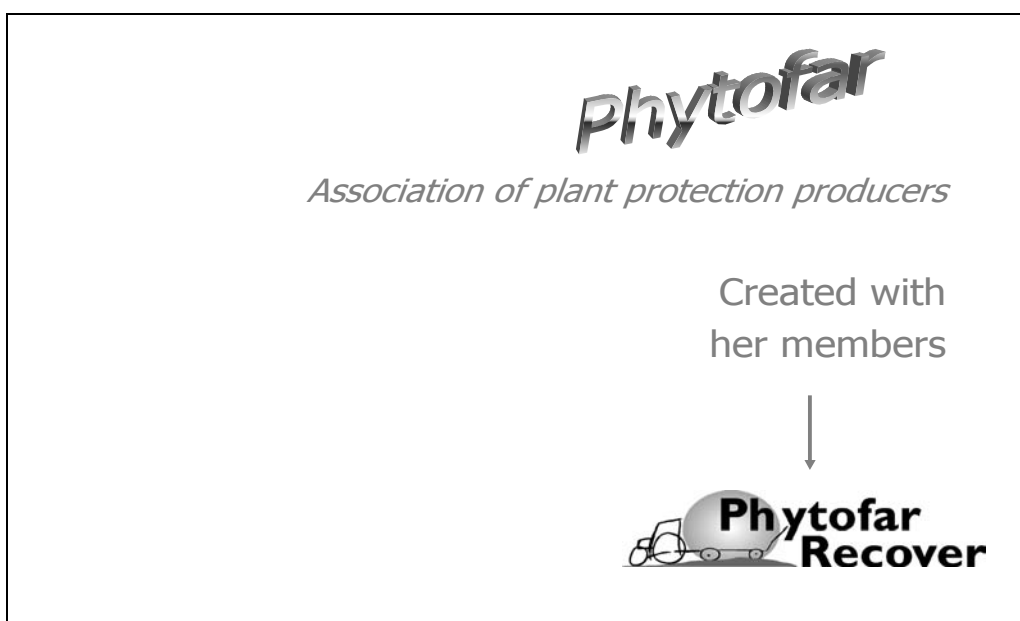
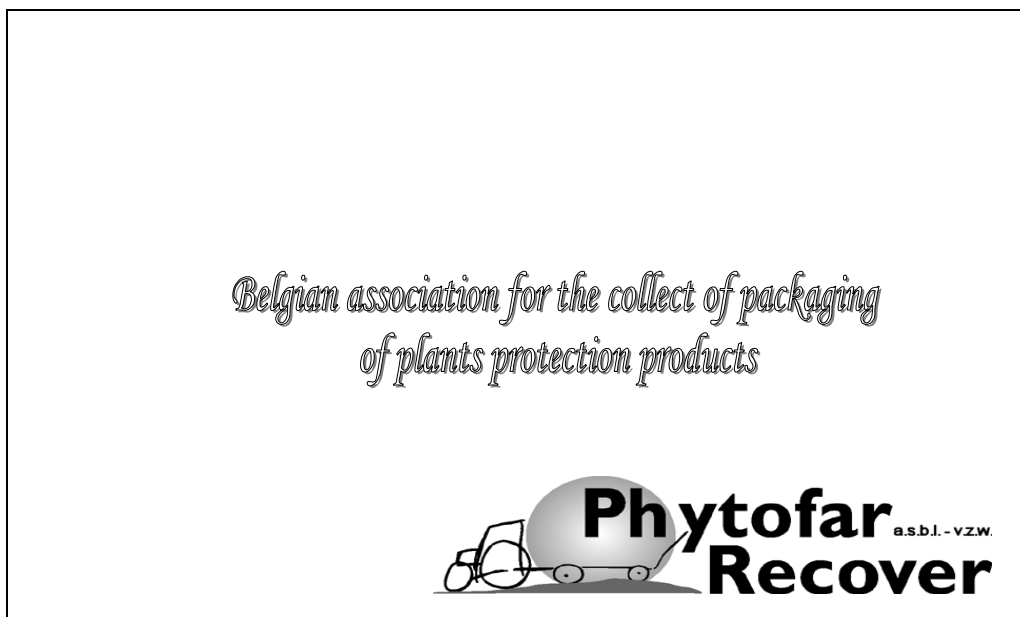
*203 Sites with containers*

*47 Sites without*

5. Before the end of March we also work out the expedition of invoices. Last year the producers and the identification's holders paid an advance on the realisation. The figures are now adapted. We ask our members to pay a new advance on the one hand based on their figures for last year and on the other based on the budget in current year.

This money will help us to restart the information campaign and to organize the following collection.

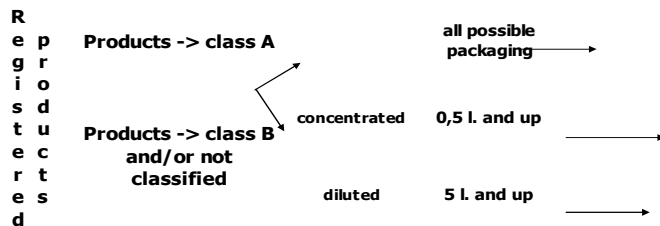
**Presentation**





- Belgian & Luxembourg scheme  
*Start in 1996 (in Belgium)*
- Eco-taxation (Law 16/07/93)  
Cost : € 1,24 / l.  
Max. € 12,50 / packaging  
*Cancelled on 01/07/03*
- Agreement on regional cooperation  
*(law 21/01/97) concerning prevention and management of packaging waste.*

- Wholesalers
  - Dealers of the wholesalers
  - Dealers and merchants
  - Professional users



Briefings → work sessions → Advertising  
→ publicity → Personal mailing → invitation

## *Professional users !*

Phytofar-Recover  
→ transparent bags


### **Primary packaging**

ONE → cleaned → dried cans

ANOTHER → paper/cardboard

Registered waste collector  
guarantee  
final accomplishment  
authorised to transport  
actual treatment possibilities  
insurance company  
200 different addresses  
70 spraying companies  
about 50 users of big volumes  
(drums > 60 l.)  
« no longer valid products »  
→ *Every second year.*

*Some results...*

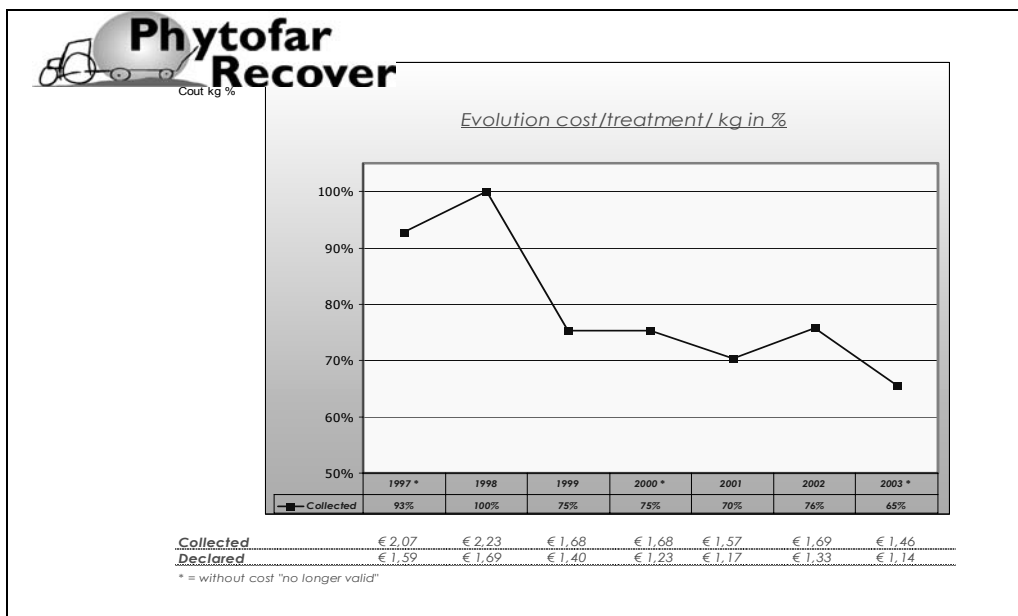
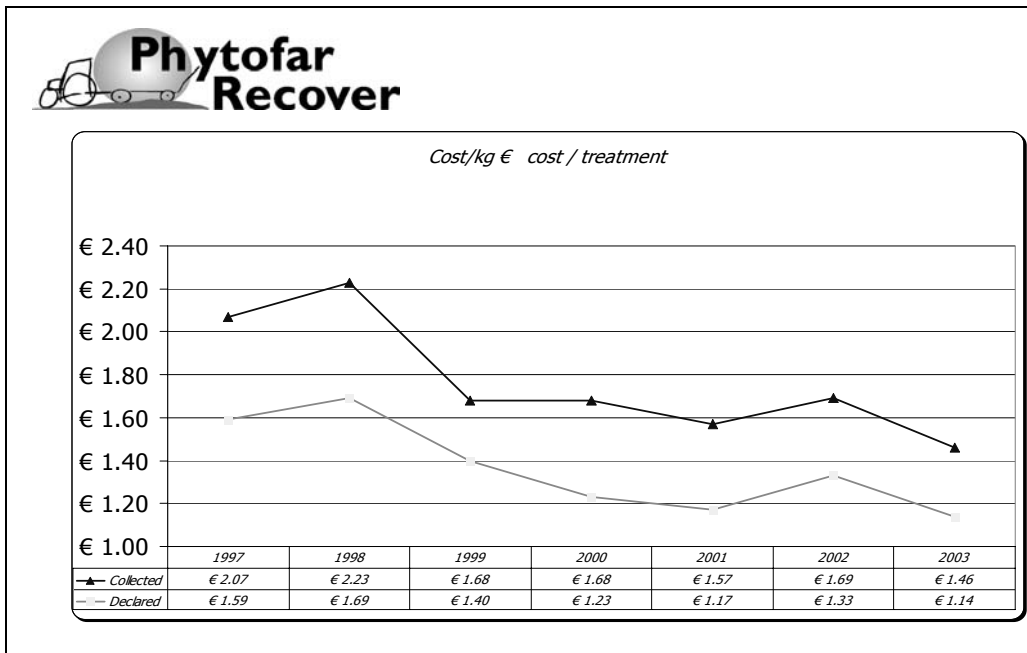
 <b>Belgium</b>		01	02	03
<b>1</b>	<b>Estimated volume</b>	599.35 ton	557,85 ton	523.23 ton
<b>2</b>	<b>Collected</b>	515.10 ton	512.04 ton	483.36 ton
		85.94%	91.79%	92.38%
<b>3</b>	<b>Hazardous</b>	26.82%	25.00%	27.59%
	<b>Non-hazardous</b>	73.18%	75.00%	72.41%
	<b>Individual users</b>	83.21%	83.30%	80.35%
<b>4</b>	<b>Spraying cy</b>	7.09%	8.27%	8.57%
	<b>Big size users</b>	9.71%	8.43%	11.08%
<b>5</b>	<b>No longer valid</b>			148.00 ton
<b>6</b>	<b>Individual users</b>	18,899	19,963	20,743
<b>7</b>	<b>Phyto.-Rec. bags</b>	37,586	40,722	40,004

<b>Luxemburg</b>		02	03
<b>1</b>	<b>Estimated volume</b>	22,03 ton	33,97 ton
<b>2</b>	<b>Collected</b>	10,48 ton	10,07 ton
<b>3</b>	<b>Hazardous</b>	10,48 ton	5,09 ton
	<b>Non-hazardous</b>		4,98 ton
<b>4</b>	<b>Individual users</b>	727	1.032

*Costs*

	02		03	
	Be	Lux	Be	Lux
<b>Operational</b>	<b>502.833,18 €</b>		<b>649.520,54 €</b>	
		<b>41.674,64 €</b>		<b>32.323,94 €</b>
<b>Publicity</b>	<b>17.191,63 €</b>		<b>11.109,21 €</b>	
		<b>4.157,44 €</b>		<b>1.209,70 €</b>
<b>Phytofar-Recover bags</b>	<b>19.498,86 €</b>		<b>18.492,03 €</b>	
<b>Management</b>	<b>197.758,53 €</b>		<b>201.671,79 €</b>	
		<b>4.035,89 €</b>		<b>4.101,25 €</b>
<b>Investments</b>	<b>128.889,32 €</b>			
<b>Total</b>	<b>866.171,52 €</b>		<b>880.793,57 €</b>	
			<i>(without cost "no longer 704.229,10 € valid" products)</i>	
		<b>49.867,97 €</b>		<b>37.634,89 €</b>

<b><i>Operational Be</i></b>	02	03
<b>Total</b>	<b>502.833,18 €</b>	<b>649.520,54 €</b>
1) Cost "no longer valid" <i>transport / treatment</i>		<i>192.726,19 €</i>
2) Workforce	109.814,00 €	108.343,75 €
3) Transport	162.133,55 €	158.352,66 €
4) Treatment	199.737,26 €	161.943,10 €
5) Other operational costs <i>insurances, communication etc</i>	<i>31.148,37 €</i>	<i>28.154,84 €</i>
Collected --> packages	<b>512,04 ton</b>	<b>483,36 ton</b>
Collected --> "no longer valid"		<b>148,00 ton</b>



**FRANCE**  
Pierre de Lépinau, Advialor

**French Crop protection waste collection scheme**

The Union des Industries de la Protection des Plantes (UIPP) represents the crop protection industry in France, and has been very active in helping to find solutions for effective and safe container management. The latest initiative, Advialor, handles agricultural waste focusing especially on the collection of empty product containers and obsolete stocks.

UIPP responded by joining forces with a wide range of agricultural organisations and distributors to establish Advialor, a voluntary organisation that spearheads container management in France. The objectives are to extend container management right across France, as well as develop and implement a plan to eliminate all obsolete stocks over a period of four years.

The philosophy behind Advialor is sharing responsibility. Farmers are urged to properly store and rinse their containers as well as deliver empty bottles and jugs to designated collection stations. Distributors of crop protection products should communicate with their customers about how to dispose of their empty containers as well as organise and control collection. Producers of crop protection products are responsible for the transport and recovery of the containers in addition to providing scientific data regarding their products.


UIPP co-ordinates the participation of industry representatives in these efforts.


A 25 per cent collection rate was achieved by the French take-back initiative for empty pesticide packaging Advialor last year. The organisation wants to raise this rate to 50 per cent by 2006. According to Advialor's annual report for 2003, some 1,840 tonnes of rigid plastic containers were collected. Compared with the 2002 total of 1,300 tonnes, this represented a 41 per cent increase. However, Advialor noted that the growth was lower than expected. One potential reason for this factor was the ten per cent decrease in the consumption of pesticides last year. In 2002, larger plastic containers holding 25 to 300 litres were collected by the association, too, for the first time. Previously, Advialor had only collected small plastic canisters with a maximum capacity of 25 litres.

Advialor announced that 1,694 tonnes of obsolete or surplus pesticides had been collected in 2003, up from 1,000 tonnes in the previous year. However take-back activities were only carried out in 33 departments rather than on a nation-wide scale. On the basis of these results, the organisation forecast that at least two collection initiatives would have to take a place in each department between 2002 and 2005 in order to ensure the elimination of all stockpiles and to create a lasting waste management solution for future arasings of pesticide residues.

In terms of the companies accepting the pesticide packaging and residues for incineration, the largest volume was sent to the cement producer Lafarge's Sandouville site, followed by the incineration plant run by Séché (formerly tredi) Environnement in Salaise and facilities operated by subsidiaries of the hazardous waste management firm Sarp Industries.


Presentation





## Crop Protection Products

## Waste Collection Scheme




Rapporter  
ses emballages c'est faire  
une fleur à la nature.

ADIVALOR

Collecte des déchets phytosanitaires. Tout le monde en profite.

# France




Avec un bidon vide,  
on peut faire beaucoup  
de choses : 8 heures  
d'électricité par exemple.

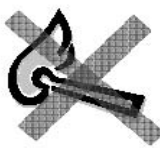

ADIVALOR

Collecte des déchets phytosanitaires. Tout le monde en profite.

Agriculteurs. Distributeurs. Industriels pour la Valorisation des déchets agricoles



## CPP waste management : regulatory context

- Burying or burning is forbidden
- Professional Waste :
  - Could be not accepted in household ecocenter
- If hazardous waste :
  - Not acceptable within the household waste
  - To be eliminated in specific and agreed sites

Agriculteurs. Distributeurs. Industriels pour la Valorisation des déchets agricoles



# Philosophy

**Pro active  
initiative from Plant Science Industry**

**sharing responsibility  
and cost**

**Safety**

**Long term strategy  
to support sustainable agriculture**

---

Agriculteurs. Distributeurs. Industriels pour la Valorisation des déchets agricoles



## type of waste accepted




Dans ce sac, uniquement Emballages Vides de  
Produits Phytosanitaires

<p style="font-size: x-small;">Sacs et boîtes pliés</p> 	<p style="font-size: x-small;">Ne pas mettre : - cailloux de transport - bâches en plastique - sacs en tissu</p> 
---	--




---



Agriculteurs. Distributeurs. Industriels pour la Valorisation des déchets agricoles



## type of waste accepted


- Obsolete stocks



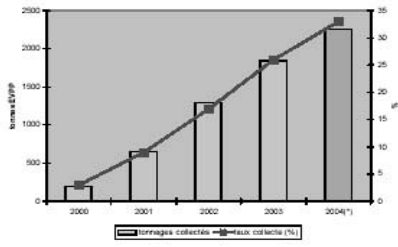
Packaging

Agriculteurs. Distributeurs. Industriels pour la Valorisation des déchets agricoles



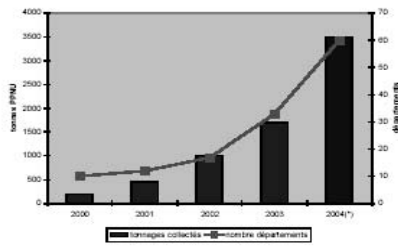
## Results

### Container management program



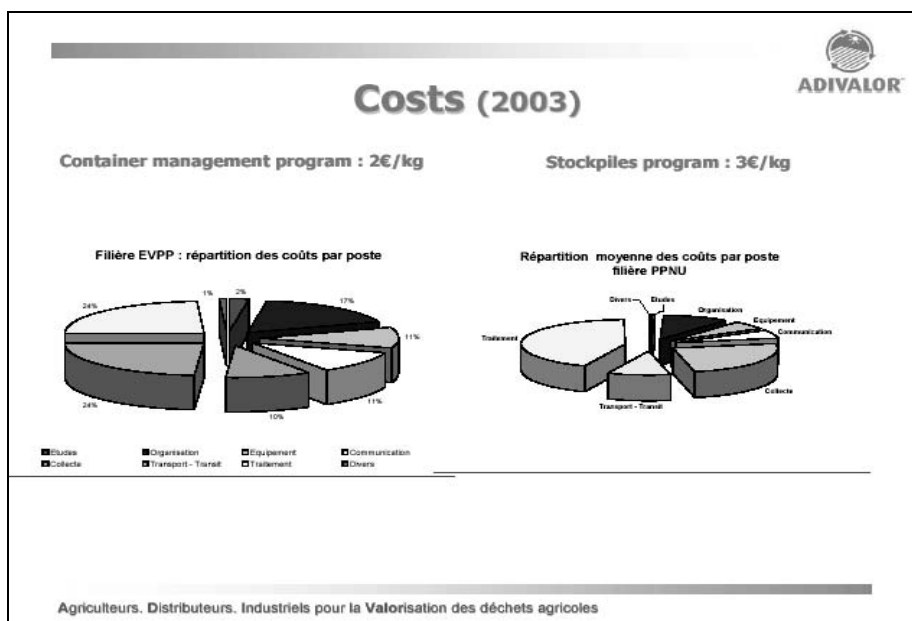
Year	tonnes collectés	taux collecté (%)
2000	~200	~5
2001	~600	~10
2002	~1300	~18
2003	~1800	~25
2004(*)	~2300	~32


### Stockpiles program



Year	tonnes collectés	nombre départements
2000	~200	~5
2001	~400	~10
2002	~900	~18
2003	~1700	~30
2004(*)	~3400	~50

Agriculteurs. Distributeurs. Industriels pour la Valorisation des déchets agricoles





<b>Barriers</b>	<b>opportunities</b>
<ul style="list-style-type: none"> <li>• Empty rinsed containers classified as hazardous</li> <li>• High cost and low competition for incineration</li> <li>• EC CP reregistration program</li> <li>• Non contributing CP company</li> </ul>	<ul style="list-style-type: none"> <li>• Ecotax exemption for CP companies</li> <li>• Subsidies for empty containers collection program</li> <li>• Enlargement to empty containers of other professional products for farmers</li> </ul>

---

Agriculteurs. Distributeurs. Industriels pour la Valorisation des déchets agricoles



**AUSTRALIA**  
Sam Ponder, Agsafe Ltd.



## Agsafe Limited

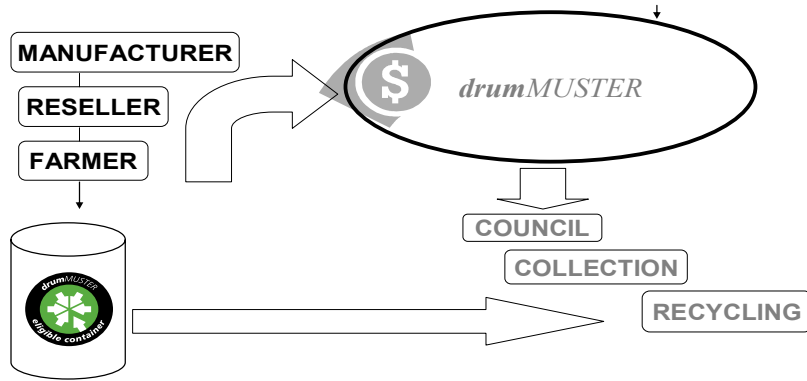
Container management in Australia  
OECD Workshop, Bonn 2004

### What is *drumMUSTER* ?

*drumMUSTER* is the national program  
for the collection and recycling of  
empty, cleaned, non-returnable  
crop production and on-farm  
animal health chemical containers.

***drumMuster provides a defined socially and  
environmentally acceptable route for non returnable  
containers.***

## How does the Program Operate ?



## INDUSTRY STRATEGIES

### RE-USE



### DRY FORMULATIONS



20L LIQUID  
FORMULATION

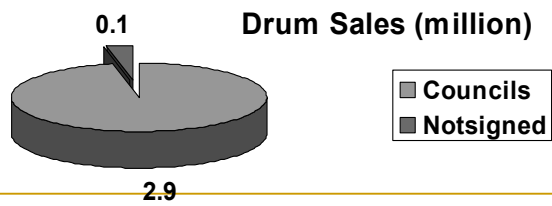


10KG DRY  
FORMULATION



### *drum*MUSTER service

- 453 councils participating in the ***drum*MUSTER** program
- Represents 98% of annual drum sales
- Provides for 2.9m of 3.0m of drums sold



**627 compounds**  
**84 run ongoing collections**



Cleanliness Check



Compound

## Achievements - National

- Since the first **drumMUSTER** collection at Gunnedah in May 1999 there have been:
  - 5,100 collections
  - 4,9m drums collected,
  - 8000 tonnes of waste recovered
  - 627 collection sites (70% have compounds)
  - 292 Inspector training courses
  - 2296 inspectors trained
  - 25 processors approved to remove material

## Processing



Baling



Transport



- 
- Issues**
- Conversion ratio's of target market
  - Cultural change
  - Dynamics of regulatory influence
  - Market for recycled products
  - Decline in re-use of drums
  - Manufacturers report high failure rate with reconditioned drums
  - Conversion rate from liquid to dry formulations
  - Less than anticipated use of water soluble packaging
- The diagram is enclosed in a rectangular box with a thin yellow border. The word 'Issues' is at the top left. A horizontal line starts below 'Issues' and extends to the right edge of the box. A vertical line starts below 'Issues' and goes down to the bottom of the box. A horizontal line starts below the last item in the list and extends to the right edge of the box.

---

## Problems - operational

- Processing
  - Speed of claims
  - Inspection variables
  - Complexity of contractual agreements
  - Remote collections
- 

---

## Strategies

- Greater coverage by FO's
  - Regional campaigns
  - Increasing awareness
-

---

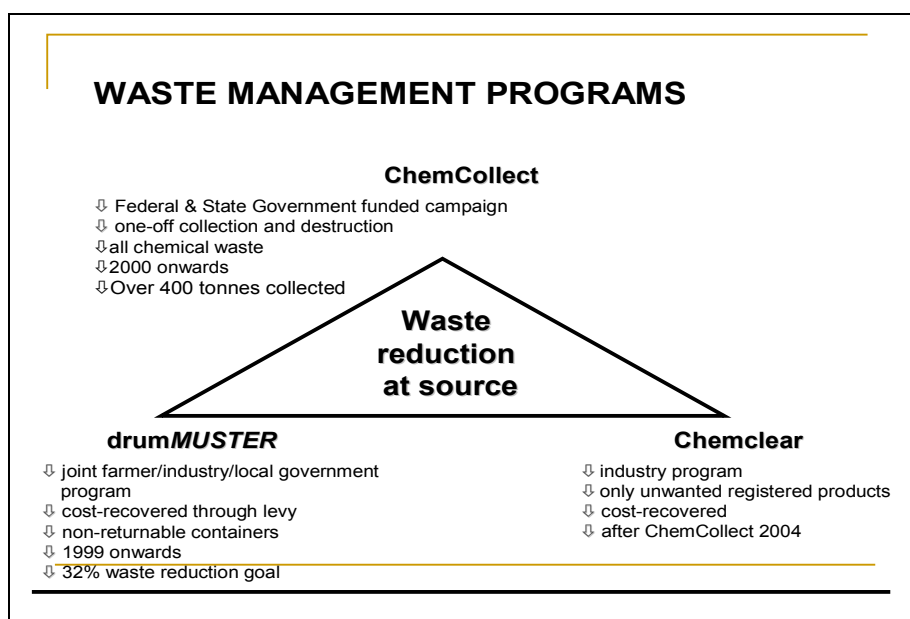
## Outcomes

- Reduced weight at source
  - A defined route for disposal
  - Recovery of containers
  - Improved occupation health and environmental practices
- 

---

## Critical Success Factors

- Multi stakeholder commitment
  - Extended producer responsibility
  - Reduction of waste at source
  - Elimination of a potentially hazardous waste problem
  - Increased recycling for materials and energy recovery
  - Consistent and reliable source of recyclate
  - A mechanism for generating sufficient and sustainable funding
-



**GERMAN FARMER**  
Heinrich Kemper

**Stakeholder Experience and Perspectives on Risk Reduction through Good Container Management by a practical Farmer.**

I am farming since 1978 on my own farm (130 ha) without livestock, working in cooperation with three other farmers, based on contracts; we share together one big trailed field sprayer - 27m width, 4000 l capacity and also 400 l clean water tank, as a separate machine behind a tractor on its own tires. There are two places where we fill up our Sprayer, both on a place with a concrete floor farmyard. The Sprayer is used on about 450 ha.

The primary effort to reduce any Risk in our daily handling with the sprayer is how we *manage the spraying* between the different crops -however, there are very few inner cleanings, during a spraying season. Secondly, if it's necessary to clean up *the* internal tank and system, it is a big success if the *tank is made from smooth* inner and outer walls, without nooks and crannies and the *technical rest of liquid is quite small*, if you change pesticides for other crops. It is necessary that the Sprayer is *equipped with special tank washing nozzles*, a *clean water tank* and a long cable with a *hand held Spray-gun lance* for external cleaning of sprayer and tractor in the fields, to avoid contamination of pesticides in ditches, rivers and other surface waters. An *induction bowl* must be standard for normal equipment, which can be used for quick filling of liquid or powdery spray agents, and of course *for canister cleaning, you need a special rotation nozzle*.

The person, who is filling up the Sprayer must be highly concentrate on his job and you should going up filling your Sprayer even if your telephone is ringing. Otherwise you wouldn't really know what ingredients are all ready in the tank. Afterwards you have to clean up the canister with the rotation nozzle and clean the canister clearly. Some of those canisters have forms which can not be cleaned completely because there are nooks und crannies. The pesticide industries have to change those canisters.

Afterwards you have to store the empty canister on your farm and bring them once year to a special place in your region where they were collected and afterwards send to a central place in Germany. The system is called "PAMIRA" and well known among farmers and distributors.

The whole system has to be tuned up and my opinion is, that nearly every two years there must be a "round table" to discuss the problems of the system and the distribution to make the system practical for all users. The main effort is that pesticides don't belong to Ditches Rivers or other surface waters.

Pesticides are made for fields and crops and for nothing elsewhere.

*Heinrich Kemper*, farmer, working on his own for the past 30 years.

**PAN UK**  
Jane Warner

## Container Management

PAN UK's experiences and  
perspective

Presented by: Jane Warner

## Outline

Examine recent experience of PAN UK:

- Africa and UK
- Agricultural/Veterinary and Home and Garden
- Highlighting the role that NGOs can play in:
  - identification of problems; and
  - development of solutions for container management

## Container management in Africa

How does PAN UK identify problems in Africa?

Independent monitor

Working with local  
NGOs

Problems identified:

incorrect storage

Problems identified:

containers for food and water  
storage

Problems identified:

theft of containers

**Problems identified:**

**sale of used containers and illegal  
trafficking**

**In Mozambique 1 large drum = one months wage**

**Problems identified:**

**inappropriate disposal**

## Role of NGOs in identification of problems/ development of solutions in Africa

- Access information that government and industry cannot reach
- Documentation
- Different perspectives/knowledge
- Awareness raising of problems and solutions
- Capacity building
- Build collaboration with stakeholders

## Disposal of home and garden obsolete pesticides and containers in UK

- Identification of problem
- 6 pesticide active ingredients withdrawn  
(= 81 products) July 2003  
(more to follow)

## Disposal of home and garden obsolete pesticides and containers in UK

- Survey results
  - 56% household have obsoletes/containers requiring disposal
  - 52% will store indefinitely
  - 2.7% pour down the drain
  - 16% put in rubbish bin
  - 74.7% would use a local authority disposal facility
  - 84% unaware of local disposal facility

## Solutions

- Work with stakeholders including national government (Pesticide Safety Directorate) local government authorities, industry (Crop Protection Association), retailers (e.g. B&Q)
- Raise awareness of disposal options
- Database of disposal facilities  
[www.pesticidediposal.org](http://www.pesticidediposal.org)

## Conclusions

- Container management is an issue for north and south, in ag/vet and home/garden
- NGOs are interested
- NGOs are not just CLI!
- NGOs can play an important role and should be involved

## ANNEX 3

**Used Pesticide Container Management Schemes:  
Collection, Rates, Charges and Costs**

<b>Country</b> (scheme/ operator name)	<b>Collection weight</b> (2003)	<b>Collection rate</b> (2003)	<b>Charge/levy/fee</b> (per container, L or kg)	<b>Reported cost</b> <i>/conversion into EUR or USD/ton*</i>
<b>Australia</b> (drumMuster)	1 652 tons	35%	AUD 0.04 (EUR 0.024) per L or per kg	<b>EUR 759/ton</b>
<b>Belgium</b> (Phytofar- Recover)	483 tons	92%	n/a	<b>total cost EUR 704 229 (2003)/</b> divided by 2003 collection of 483.36 tons gives <i>EUR 1 463/ton.</i>
<b>Brazil</b> (inpEV)	7 800 tons	35%	n/a	n/a
<b>Canada</b> (CropLife Canada)	658 tons	70%	CAD 0.54/cont. (about USD 0.36/cont.)	<b>total annual cost = CAD 4 million (USD 2.9 million)</b> /divided by total annual recovery of 658 tons gives <i>USD 4 407/ton.</i>
<b>France</b> (Adivalor)	1 840 tons	25%	n/a	<b>EUR 2/kg packaging material (2003)</b> <i>/ EUR 2 000/ton</i> (incineration cost about EUR450 - 480/ton)
<b>Germany</b> (PAMIRA)	1 545 tons	52%	n/a	<b>EUR 1 075/ton (2003)</b>
<b>Hungary</b> (CSEBER)	760 tons	45%	EUR 0.04/litre (2-25 L containers), EUR 1.00/cont. (26-60 L), EUR 2.00/cont. (61- 250L), EUR 3.50/cont. (>250 L)	<b>Total cost EUR 720 000 (2003)/</b> divided by 2003 collection of 760 tons gives <i>EUR 947/ton</i>
<b>USA</b> (ACRC)	3 175 tons	28%	n/a	<b>total annual cost= USD 3.9 million/</b> divided by total annual recovery of 7 million pounds (=3 175 tons) gives <i>USD 1 228/ton</i>

n/a: not available

**\*NB:** The reported cost figures are assumed to be based on total programme cost including operation (labour/inspectors, transport, treatment/disposal), management, publicity and communication. Some of the reported cost figures may not be comparable if cost items included in the total are not the same (e.g. excludes management or publicity costs). The unit conversion is for the purpose of rough and crude comparisons in terms of cost per ton, and need further refining by equalising the reported costs to make

them comparable. Proper analysis would require further information on the operational and financial details of the container management schemes, economics of the recycling markets, etc.