ISSN 1020-4695

FAO PESTICIDE DISPOSAL SERIES

5

Prevention and disposal of obsolete and unwanted pesticide stocks in Africa and the Near East

Second consultation meeting

Food and Agriculture Organization of the United Nations

Field document
GCP/INT/572/NET

FAO PESTICIDE DISPOSAL SERIES 5

Prevention and disposal of obsolete and unwanted pesticide stocks in Africa and the Near East

Second consultation meeting

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
Rome, 1997

Foreword

Most developing countries, especially in Africa, are facing severe environmental and public health problems with obsolete pesticide stocks. The importance of this issue was best summed up in the address by Professor G. Kanoute of the Health Ministry of Mali, who is Vice President of the Intergovernmental Forum on Chemical Safety (IFCS):

I wish to express my appreciation and thanks to FAO, particularly the Plant Protection Service, for taking an active interest and for being dedicated to the problems related to obsolete pesticides in developing countries. Equally, I would like to extend my satisfaction and thanks to the Government of the Netherlands for having alone taken interest and given financial backing to the very serious problem of obsolete stocks in Africa and the Near East. I also wish to express my thanks and satisfaction for the opportunity to participate in this second consultation. I find the meeting motivating and encouraging. The strong beginning currently being made is definitely getting the issue to the top of the international agenda. I am convinced that a good foundation is being laid. We should make sure that the progress already made does not slip backwards. The necessary support and guarantees need to be secured until all obsolete pesticides afflicting the poor nations are removed and the goal achieved.

I am speaking with emotion, anxiety and with many tones on behalf of Africa, the Sahel region, the Intergovernmental Forum on Chemical Safety (IFCS) and myself. Africa is under stress because of the serious problem of obsolete pesticides and the problems associated with them.

Pesticides were given, purchased or received with very good intentions. This is true not only in Africa but in every developing country. Unfortunately the very pesticides that were meant to bring good, increase food, prevent or destroy pests, have, on the contrary, turned against the health of human beings, animals and the environment. I admit, developing countries have contributed in a big way by simply being unaware of the consequences but, equally, others have taken advantage of the situation. This means that all are in some way responsible for the accumulation of obsolete pesticides.

Is it only the Netherlands Government that has realized the problem and given us the necessary support through the FAO project and with substantial commitment? If this is not so, why do others delay with help, backing, technology and solutions? The direct involvement of the German Agency for Technical Cooperation (GTZ) in the issue of obsolete pesticides is of course a great stride forwards and therefore highly commendable. If solving the problem is delayed longer, the costs will double, the suffering will multiply and the environment will be irreversibly damaged. The interest of the European Union is beginning to emerge positively in this sphere of need. I consider this a blessing. The representation of the chemical industry by GIFAP is also extremely encouraging and timely. However, more thanks will go to them after their presence is further ascertained and substantiated with deeds and figures.

Developing countries that are currently suffering and experiencing this affliction have little or no expertise, no financial resources and of course no alternatives. They need help and, specifically, help to remove obsolete pesticides that have become a nightmare to every household, to every person and to every government.

The magnitude, the urgency and the seriousness of the problem cannot be

underestimated. The various guidelines, the pesticide inventory, the excellent illustrative posters and videos produced by FAO are clear signs of the importance attached to this monumental problem. I could say more on this issue but I am afraid it might be superfluous. I do not intend to be so but, on the other hand, I cannot hold back what is true and what is on my mind.

Aware of the prevalence of persistent organic pollutants (POPs) in developing countries, the IFCS has given special attention to the issue of obsolete pesticides by initiating two special sessions to look specifically into obsolete chemicals. The IFCS Working Group on Obsolete Chemicals documented its message which clearly and concisely expresses the issue of obsolete pesticide stocks and the need for urgent support.

I wish on behalf of the IFCS, developing countries and particularly Africa, which has little or no resources, strongly to request donor countries and the financial community of the European Union and Organisation for Economic Co-operation and Development (OECD) countries and the chemical industry to coordinate with FAO and contribute their financial assistance for the removal and destruction of obsolete pesticides. On the other hand, in my capacity as the IFCS Vice President and as an African through the Organization of African Unity, I request that recipient countries take strong action to control and avoid further accumulation for their own good.

Finally, as has already been expressed many times, I would like to thank the Government of the Netherlands for its continued commitment and support given us through FAO.

In conclusion, I wish to say: please make sure that efforts are coordinated to avoid duplication of resources and the loss of valuable efforts. I wish us all a successful meeting. I thank you all for the interest and patience you have kindly given me.

Contents

Introduction

Obsolete, unwanted and banned pesticides have continued to pose serious environmental and public health hazards. Accumulation of obsolete stocks has continued unabated. Contamination of soils and valuable drinking water resources is widespread. Lack of appropriate management, misuse of pesticides, uncoordinated pesticide donations, substandard storage, poor storekeeping, lack of expertise and financial resources are major contributors to the problem. Developing countries are the most badly affected, mainly because of the lack of understanding of the inherent dangers of pesticides and the means to protect people. Urgent solutions are needed.

With financial backing from the Government of the Netherlands, FAO established a two-year project to address these basic issues and to prepare the groundwork for more comprehensive action for concerted international efforts. The project, *inter alia*, calls for a consultation meeting once a year, the first of which took place in December 1994.

Objective of the meeting

The main objective of the Second Consultation on the Prevention and Disposal of Obsolete and Unwanted Pesticide Stocks in Africa and the Near East, held from 2 to 3 September 1996 in Rome, Italy, was to provide a continuing forum for information exchange, discussions, cooperation and collaboration. In more detail, the objectives were to:

- exchange experiences and lessons learned in already completed pesticide disposal activities;
- exchange information on future prevention and disposal activities;
- coordinate activities more fully and develop a framework for donor cooperation in large-scale disposal operations;
- learn about new developments in the legal, policy and technical arenas for pesticide disposal;
- discuss issues of common interest.

Presentations were made by donor representatives and participants on aspects related to disposal activities undertaken and planned for the future. Discussions and statements about policies and future plans were highlighted. The dates for the Third Consultation meeting will depend on progress made. The situation will be reviewed by December 1997 and dates may be determined then.

Participants

The Director-General of FAO invited representatives from aid agencies, developing countries, public international organizations, environmental groups and the pesticide industry. About 16 organizations attended the meeting and several others expressed interest, but were unable to attend because of other obligations. For the list of participants, see Annex 4.

Opening address

N.A. van der Graaff

On behalf of the Director-General of FAO, Dr Jacques Diouf, I wish to welcome you to the Second FAO Consultation meeting on the Prevention and Disposal of Obsolete and Unwanted Pesticide Stocks in Africa and the Near East.

As you may be aware, FAO's efforts to look at the problem of obsolete pesticides began with financial support of a two-year project by the Government of the Netherlands. Although cleaning up and removal of the entire obsolete pesticide stocks is still far from being completed, the project has so far been able to act as a focal point for attracting attention, collection of data, dissemination of information, advising affected governments, formulation of projects, preparation of technical guidelines and their distribution and training of technical staff, etc. The current meeting, as well as that which took place in late 1994, is a result of the existence of the project. I should, therefore, right from the outset, take the opportunity to say that FAO would like to express its deep appreciation to the Government of the Netherlands for its continued financial support and for having made possible both the initiation and follow-up of this colossal task. Our ultimate goal is international cooperation in the development of strategies and policies for the disposal and prevention of accumulation of obsolete stocks.

In such a forum of consultation, it is hoped to establish an appropriate agenda for cooperation and to decide on modalities for disposal operations in the future. Obsolete pesticide stocks have been identified, at least in some of the countries where surveys have been completed, and work will go on in the remaining countries. FAO will continue to identify problem areas in relation to obsolete pesticides and will make relevant information available at similar consultation meetings. However, in order to accomplish the task, there is a need for commitment and cooperation from more donor countries, organizations and industry, particularly with regard to financial assistance and related issues. In order to remove and dispose of the pesticide stocks so far identified and those yet to be compiled, FAO is looking for a positive response from the international community.

The problem of obsolete pesticides is not limited to Africa and the Near East alone. Environmental and health issues are at stake in almost all developing countries. In an FAO press release of June 1996, the existence of an estimated total of well over 100 000 tonnes of obsolete pesticides in non-OECD countries was brought to the attention of all concerned. The alarming news given in the press release was taken a step further by other international news media, including national papers in several countries and languages. The FAO press release received global coverage and the resulting feedback came from a wide variety of sources. It seems as if the world has woken up to the serious problems of obsolete pesticide stocks worldwide.

The enormity of the problem being widespread and urgent, FAO will spare no effort and will continue updating information on obsolete pesticide stocks, making the situation known to donor countries, to the public and to the world at large. Every possible medium including newspapers, radio, television and the Internet will be used. Delays in action will only further exacerbate the situation and will make the problem more difficult to deal with both from the points of view of finance and of environmental implications. Global mobilization and awareness of all concerned need to be created, not only under limited conditions, but involving developing nations, countries in transition, donor nations, non-governmental organizations, international organizations, etc. Awareness should lead to commitment to a concerted global effort to save the environment from pesticides that are considered obsolete and hazardous. Tackling the risk to human health and animal life should not be postponed for too long.

As we live in a world that never stops changing, change is a continuous phenomenon. We therefore need to adapt to changes. Pesticides were considered the miracle weapons for the prevention and control of pests and for boosting agricultural production. The early discoveries of organochlorine pesticides received high acclamation, recognition and rewards. However,

the euphoria was not to last for ever. During the 1960s, some of the most revealing accounts of the negative environmental impact of the pesticides concerned became apparent. By the 1970s some of the persistent organochlorines were banned from use in almost all developed countries. Most are persistent in the environment, are health hazards, contaminants and pollutants. In good faith, donors and organizations assisted developing countries by donating pesticides to countries in the tropics, particularly in sub-Saharan Africa where pests are most prevalent, endemic, persistent and widespread. Governments in these regions were happy and satisfied to get assistance. Most countries either purchased or requested pesticides in abundance, not because of greed but because of the need to protect crops against the outbreak of devastating seasonal and endemic pests. Unfortunately, some of the very pesticides intended for a good purpose and received or given with good intentions, or purchased in good faith, accumulated over the years. These left-over, obsolete pesticides are now giving rise to serious environmental and health problems.

It is time to clean up this problem without pointing a finger at anyone in particular. There is a shared responsibility among donors, the chemical industry, international organizations as well as recipient countries for having contributed to the problem. The confidence of the 1940s and 1950s, which favoured total dependence on the use of pesticides as a sole means of pest control, has gradually been reversed and the alternative is now integrated pest management (IPM). There is a need for prudent use of pesticides that are selective, safe, non-persistent and environmentally sound.

We are at a crucial crossroads where commitment and cooperation, dedication and collaboration are needed. As has already been indicated, in the First FAO Consultation meeting in 1994, the estimated total of obsolete pesticide stocks in Africa alone was 20 000 to 30 000 tonnes. With the inventory having been completed in at least 33 African countries, the revised estimate for Africa is now in the region of 20 000 tonnes. There are 23 countries from which data have yet to be collected and therefore, hopefully, this estimated total will remain the same after the survey has been completed in every country in Africa. The inventory compiled so far does not include contaminated soil, materials or containers, which might be up to 50 percent of the actual stock in individual countries.

In order to alleviate the situation, a massive global mobilization of resources is needed. Although much interest has been expressed in support of the cleaning up and disposal of obsolete pesticides, so far only a few agency initiatives for action on prevention and disposal have been taken. In this connection, we express our appreciation for the continued efforts being undertaken by the German Agency for Technical Cooperation (GTZ) to remove obsolete wastes from a number of countries. Likewise, appreciation is again expressed to the Government of Netherlands for undertaking a disposal operation in Zanzibar. This is in addition to supporting the FAO project already mentioned above.

Once again, on behalf of FAO and the Director-General, I wish to express my thanks and appreciation for your patience, for the efforts you have made to attend this meeting, for being ready to listen and participate. It is necessary to understand and accept the collective responsibilities and to look forward eagerly to positive solutions to a common problem that is both important and urgent and for which a common effort and commitment are needed. Without these qualities, it will be difficult to make advances in solving the huge problem of obsolete pesticides which lies ahead of us.

The information you may be exchanging with each other and the motivation and drive you may be experiencing during this meeting can be the foundation for the development of the global effort required to clean up pesticide wastes caused by human beings.

I wish you a very successful meeting and a very enjoyable stay in Rome.

Chapter 1

Obsolete and unwanted pesticide stocks

A. Wodageneh

The problem

The problem of obsolete pesticides remains extremely serious and urgent. Many of the stocks identified continue to deteriorate thereby giving rise to an ever escalating source of severe pollution and posing a threat to human health, the environment and development in particular. The situation is most serious in almost all developing countries because there is little or no awareness of the inherent danger of pesticides. There are neither the capacity nor the facilities for disposal, nor the financial resources to handle problems related to obsolete pesticides.

Main concern

The concern is not only about obsolete pesticide stocks, which have given rise to serious environmental problems, but also the fear of their possible accumulation in the future. Disposal of existing stocks is as important as prevention of accumulation. The latter, *inter alia*, reflects the lack of attention paid to various important aspects such as management of pesticides and their use and distribution. In view of ever increasing annual pesticide sales and distribution worldwide, the strategy for the prevention of accumulation needs to start even before their acquisition.

As reported during the First Consultation meeting in late 1994, total global sales of pesticides for the period 1993/94 were close to US$23 billion. In 1995 pesticide sales worldwide reached US$29 billion, of which pesticides worth nearly US$24 billion were sold by 11 major companies. The breakdown by company is given in Figure 1. The increase in sales of pesticides over 1994 is nearly 21 percent. Although the share of pesticides reaching developing countries is proportionally smaller, the trend of pesticide use and distribution is increasing.

Whether or not the root cause of obsolete pesticides can be traced back to the source is not the question. Pesticides became obsolete either because they were imported, sold, dumped, given away or donated. A quick solution to the problem cannot be provided by looking backwards or trying to determine who was responsible. The problem is obvious and cannot be hidden; it is hazardous and requires urgent solution. Words used in this context such as need, universal, global, common effort, concerted, commitment, resources, follow-up, sustainability, collaboration and cooperation are a reflection of the need for continued assistance. Obsolete pesticides are a common global problem requiring a global solution. Yemen had to wait nearly 30 years for a solution which came only after a great deal of damage had been done to the environment. Reliable statistics as to how many people have been affected over the years are not available and the same is true in many developing countries.

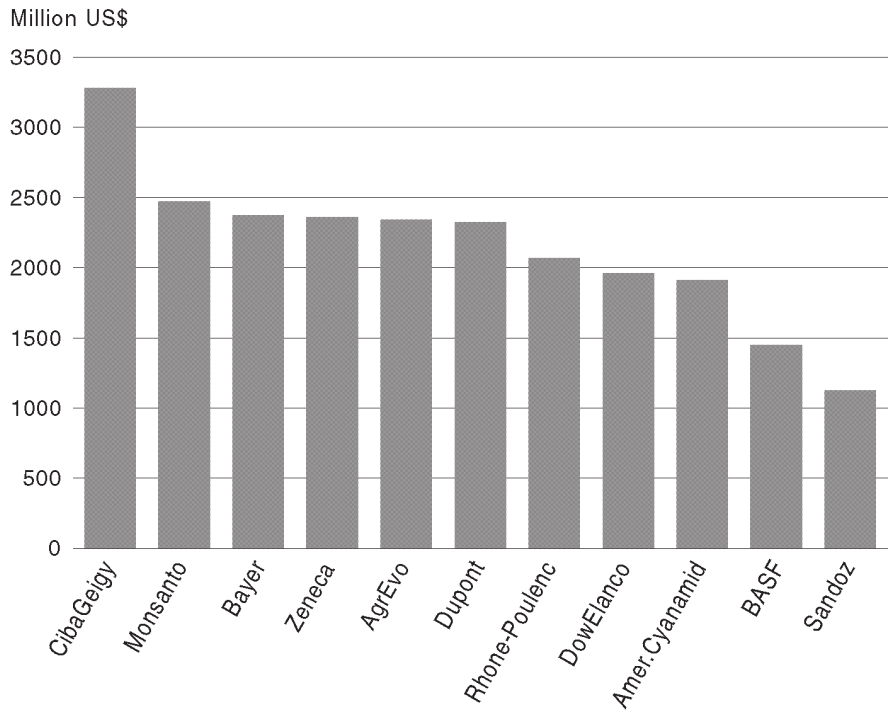
Although it might not be a remedy for the currently existing obsolete pesticide stocks, there is a positive basic concept of thinking beginning to emerge in many countries; an awareness and appreciation of the importance of a sound environment. It is therefore time to find ways and means to accelerate and encourage this trend of thought in order to enhance both disposal and prevention of obsolete pesticides.

Status of obsolete pesticide inventory

The estimate of existing obsolete pesticides in Africa currently stands at 20 000 tonnes. As of September 1996, an inventory was completed for 39 countries (including Zanzibar) in Africa and four in the Near East. The total of obsolete pesticide stocks recorded to date in the countries where the survey has been completed is nearly 9 300 tonnes and 937 tonnes, existing and disposed of, respectively. The summary in Table 1 gives a quick reference to the current status of obsolete pesticides in the two regions. Details of pesticides by country plus a group of similar pesticides in different countries but listed in alphabetical order are compiled and reported separately.

Other than the total of obsolete pesticides given in Table 1 and shown as quantities disposed of, some unknown quantities are also believed to have been disposed of from stocks owned by unknown companies in one or two countries in Africa. However,

FIGURE 1
World pesticide sales of some major companies in 1995



Company	Description	Sales region	US$ million	Percentage increase over 1994
CibaGeigy	Swiss multinational	N. America & Europe	3 284	11.2
Monsanto	US-based multinational	India etc.	2 472	11.1
Bayer	German-based multinational	US, Asia, L. America	2 373	21.7
Zeneca	UK-based multinational	China, Thailand	2 363	12.3
AgrEvo	German multinational	US, China etc.	2 344	14.6
Dupont	United States	Various	2 322	8.9
Rhone-Poulenc	France	Various	2 068	14.6
DowElanco		Various	1 962	13.1
Amer. Cyanamid	United States	Various	1 910	19.4
BASF	Germany	Various	1 450	15.3
Sandoz	Switzerland	Various	1 125	12.4
Total			**23 673**	

Source: Agrow, 1, 15, 29 March, 19 April 1996; Agrow, World Crop Production News, PANUPS, 30 April 1996.

TABLE 1

Inventory of obsolete and unwanted pesticide stocks by country

Country	No. of affected sites	No. of different pesticides	Total *(tonnes)*	Total disposed of *(tonnes)*	Agencies involved in disposal
AFRICA					
1. Benin	20	±21	67		
2. Botswana	1	7	25		
3. Burkina Faso	24	57	54		
4. Burundi	2	5	58		
5. Cameroon	20	10	225		
6. Cape Verde	1	12	23		
7. Central African Rep.	±15	14	238		
8. Congo	7	1	2		
9. Equatorial Guinea	22	17	146		
10. Eritrea	29	58	158		
11. Ethiopia	143	±70	426		
12. Gambia	±7	>5	23		
13. Guinea Bissau	4	9	9		
14. Madagascar	4	14	76	70	GTZ
15. Malawi	11	29	127		
16. Mali (provisional)	28	9	125		
17. Mauritania	13	11	257		
18. Morocco	25	±170	2 265		
19. Mozambique	48	±150	443	160	GTZ
20. Namibia	1	1	245		
21. Niger	±15	29	52	60	USAID/GTZ/Shell
22. Sao Tome/Principe	1	3	3		
23. Senegal	8	±21	274		
24. Seychelles	1	37	10		
25. South Africa	Several	±30	390		
26. Sudan	44	±80	657		
27. Swaziland	2	35	9		
28. Tanzania		DNOC inventory	55	GTZ	
29. Togo	7	>20	85		
30. Tunisia	21	5	882		
31. Uganda		Dieldrin inventory	50	FAO	
32. Zaire	5	11	591		
33. Zambia (estimate)	6	±51	336		FAO/DGIS/GTZ
34. Zanzibar	Several	±100		280	DGIS
NEAR EAST					
1. Iraq	16	5		232	
2. Lebanon	Several	Several	189		
3. Qatar	1	7	5		
4. Syrian Arab Rep.	20	13	323		
5. Yemen	> 20	±130	262	262	FAO/KfW
Total			**9 292**	**937**	

Note: The above is a compilation of results of inventories up to September 1996. The figures do not include quantities of contaminated soils and materials which can be substantial and thus the final total should be expected to be much higher.

as the actual total disposed of has not been reported to FAO, figures could not be included in the inventory. There are still 23 countries in Africa and five in the Near East where the survey will continue. The total of 9 292 tonnes indicated does not include contaminants such as materials, containers and contaminated soil which, in addition, should be estimated at about 50 percent of the actual total. Of the total compiled so far, 11 different pesticides make up 55.46 percent as indicated in the table and graph in Figure 2.

Undeclared obsolete pesticides

It is also likely that additional undeclared obsolete pesticide stocks may exist in any of the countries where the survey has taken place. Such figures usually become apparent either before or as soon as disposal operations begin. A good example is a case in Zambia where a huge pile of pesticides and contaminated soil was kept in the open for years within the storage compound of the Zambia Cooperative Federation (ZCF) in Lusaka. During a visit of the FAO Project Coordinator to the site in April 1994, a total of 85 tonnes had been estimated to exist. However, during a joint FAO/GTZ visit to the same site in September 1995, a total of about 300 tonnes was found. This is an example of what can happen after assessment of stocks has been made. The FAO obsolete pesticide inventory data base is bound to change from time to time as more data are made available and surveys completed.

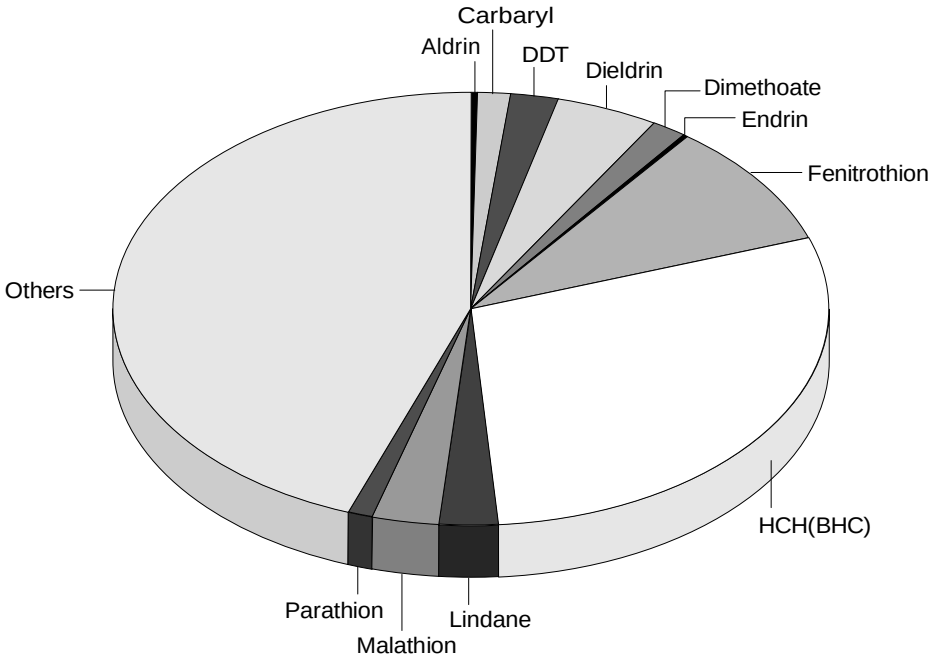
THE FAO PROJECT ON OBSOLETE PESTICIDES GCP/INT/572/NET

Prevention and disposal of unwanted pesticide stocks in Africa and the Near East

With financial assistance from the Netherlands Government, in July 1994 FAO started operating a two-year regional project covering Africa and the Near East. The objectives of the project included:

- development of the foundation for a comprehensive long-term programme with multi-donor involvement to dispose of obsolete pesticide stocks in pilot countries;

FIGURE 2
Major pesticide groups



Major pesticides	Total of each	
	Litres/kg	Tonnes
Aldrin	8 259	8
Carbaryl	136 968	137
DDT	202 723	203
Dieldrin	435 987	436
Dimethoate	150 626	151
Endrin	1 762	2
Fenitrothion	875 865	876
HCH (BHC)	2 759 427	2 759
Lindane	251 126	251
Malathion	284 240	284
Parathion	108 209	108
Others	4 190 808	4 191
Total	**9 406 000**	**9 406**

Note: The total of pesticide stocks considered as major is 5 215 192 l/kg (or 5 215 tonnes), i.e. 55.46 percent of the total. This percentage figure appears to remain at about the same level despite changes in the grand total as new figures are received from time to time.

- prevention of further accumulation;
- development of guidelines on the prevention of accumulation of obsolete pesticide stocks;
- development of guidelines on the safe and environmentally sound disposal of bulk quantities of obsolete pesticides from developing countries (a result of collaborative efforts of FAO, UNEP and WHO);
- preparation of a pesticide storage and stock control manual;
- compilation of an inventory of obsolete pesticide stocks;
- undertaking pilot disposal activities in selected countries.

The objectives listed are being tackled and progress is being made, but much remains to be done and a great deal of time will be necessary to achieve the ultimate objective leading to a cleaner, healthier and better environment.

Publications

a. Basic technical guidelines:

Technical guidelines will be available in four languages: Arabic, English, French, Spanish. Three basic guidelines have been prepared:

- *Prevention of accumulation of obsolete pesticide stocks* (No. 2)
- *Pesticide storage and stock control manual* (No. 3)
- *Disposal of bulk quantities of obsolete pesticides in developing countries* (No. 4)

b. Other publications:

- *First Consultation meeting: Prevention and disposal of obsolete and unwanted pesticide stocks in Africa and the Near East,* which took place from 12 to 14 December 1994 (No. 1 only available in English).
- *Second Consultation meeting: Prevention and disposal of obsolete and unwanted pesticide stocks in Africa and the Near East,* which took place from 2 to 3 September 1996 (No. 5 will also be made available in English).
- *Inventory of obsolete, unwanted and/or banned pesticides,* a working document which is subject to continuous changes.

Currently, those guidelines that are considered basic i.e. No. 3 and No. 4 are all available in English. Guidelines No. 2 is available both in English and French, and the Spanish and Arabic versions should be ready for distribution by the end of 1996. The three guidelines (each in four languages) and the reports of the First and the Second FAO Consultation meetings make a total of 14 publications available for distribution to member countries through FAO representatives' offices. Other institutions, universities and research organizations etc. receive the publications by mail. In addition, all the guidelines are being made available via the Internet (World Wide Web) address: http://www.fao.org, at the FAO GLOBAL WATCH, logo, subtitle Obsolete pesticides. At this web-site, the guidelines can be read, downloaded and printed. The option of making them available became increasingly necessary, especially after a flood of requests for publications and information was received from all over the world particularly after the FAO press release on obsolete pesticides of June 1996. The list of guidelines and publications is given in Table 2 below.

Role of the project

The project plays a major role in putting the issue of pesticide disposal on the international agenda and in bringing together aid agencies interested in assisting with pesticide disposal.

TABLE 2

GCP/INT/572/NET publications and reference numbers

No.	Serial No.	Reference No. and year	Document and language of publication
	1	**W1604**	**First Consultation meeting: "Prevention and Disposal of Obsolete and Unwanted Pesticide Stocks in Africa and the Near East"**
1	1	1995	English
	2	**V7460**	**Provisional guidelines: "Prevention of accumulation of obsolete pesticide stocks"**
2	2	1995	English
3	2	1996	French
4	2	1996	Arabic
5	2	1996	Spanish
	3	**V8966**	**"Pesticide storage and stock control manual"**
6	3	1996	English
7	3	1996	French
8	3	1997	Arabic
9	3	1996	Spanish
	4	**W1604**	**Provisional guidelines: "Disposal of bulk quantities of obsolete pesticides in developing countries"**
10	4	1996	English
11	4	1996	French
12	4	1997	Arabic
13	4	1996	Spanish
14			**"Inventory of obsolete, unwanted and/or banned pesticides"**
15	**5**	**W3338**	**Second Consultation meeting: "Prevention and Disposal of Obsolete and Unwanted Pesticide Stocks in Africa and the Near East"**
	5	1997	English
		Total of	**15 documents**

Related project activities

- initiating disposal operations on behalf of developing countries;
- assistance in obtaining funds for such operations;
- enhancing donor coordination;
- provision of independent monitoring services to ensure that disposal operations fully comply with international safety and environmental standards;
- review of new disposal methods;
- study and investigation of solutions to the problem of contaminated soil;
- organization of national seminars on pesticide stock planning and store management to prevent stocks deteriorating.

Major disposal operation undertaken in Yemen

A disposal operation has taken place under the supervision and monitoring of FAO. A total of 262 tonnes of obsolete pesticides were removed from 20 different sites (Figures 3 and 4) and successfully disposed of between March and June 1996. The major field operation was completed in six weeks during which period almost all obsolete pesticides were brought to a central location at Hodeidah and subsequently shipped to the United Kingdom for incineration. The conditions under which the disposal operations were conducted were hot and/or humid, dusty and unpleasant, with the affected sites being far apart but fortunately accessible. Without the full cooperation of the Department of the Plant Protection of the Ministry of Agriculture and the FAO Representative, more difficulties could have been encountered.

Planned disposal operation in Zambia

A plan has already been initiated by FAO/GTZ for a

FIGURE 3
Mobilization and centralization of pesticide waste prior to shipment to the United Kingdom

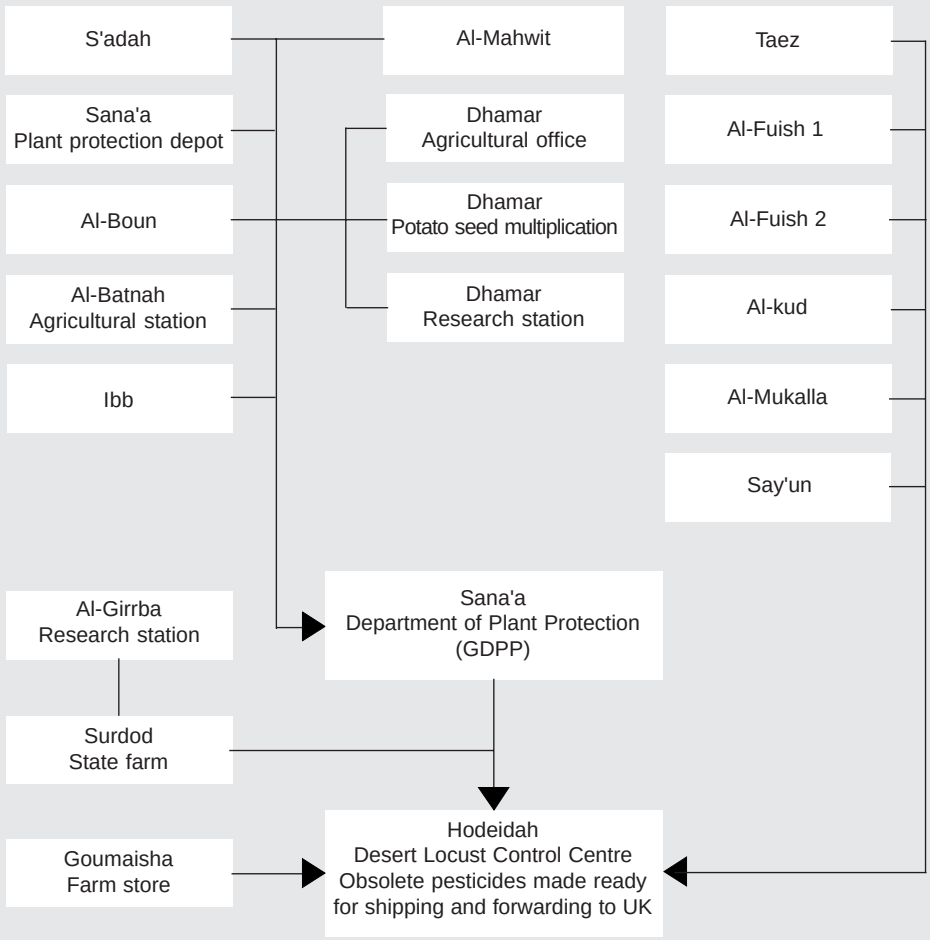


FIGURE 4
Obsolete, unwanted and banned pesticides in Yemen: relative locations, affected sites and waste disposed of

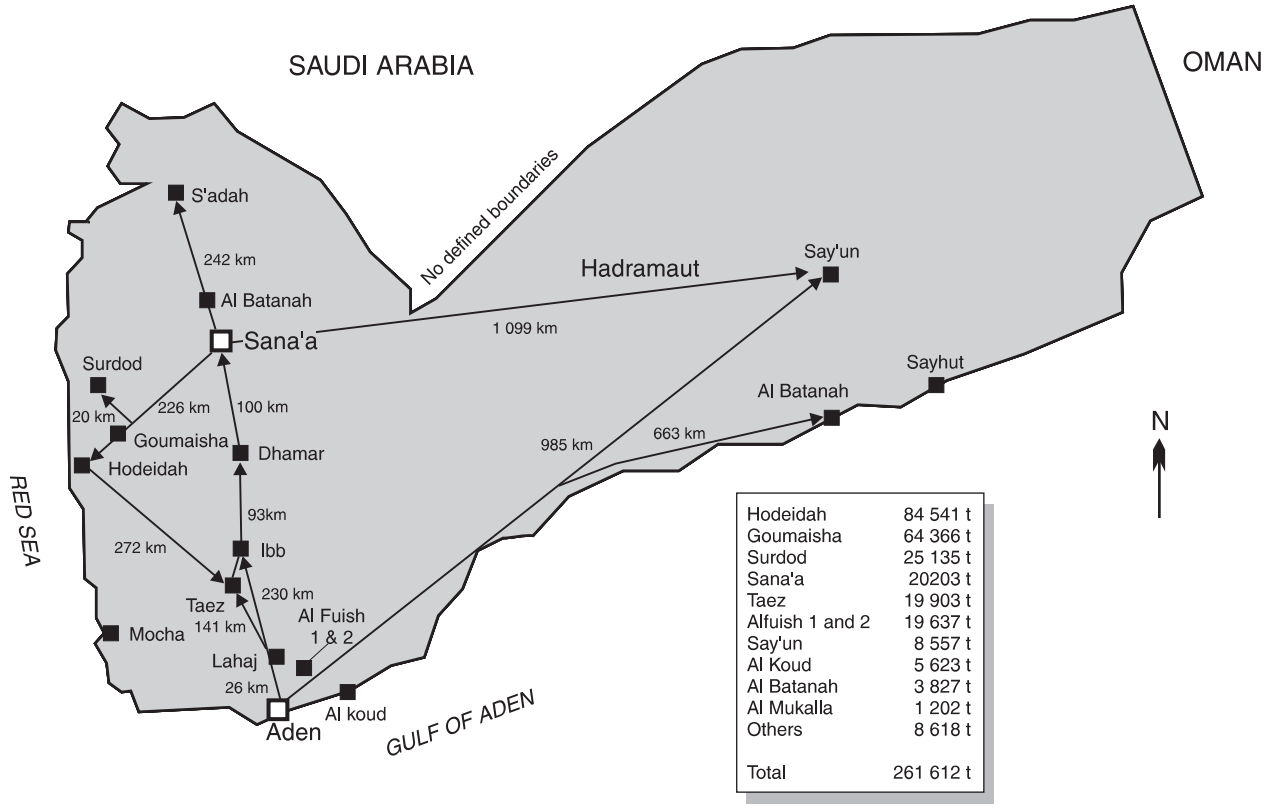


FIGURE 5
Affected sites and quantities of obsolete pesticides in Zambia

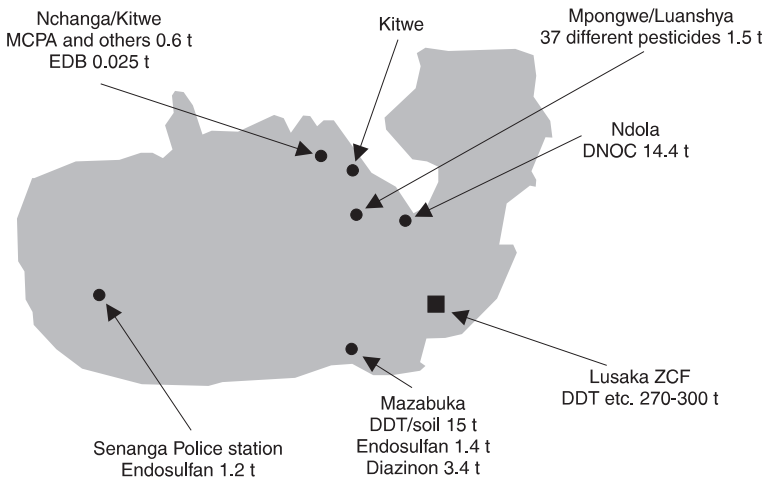


TABLE 3
Types and quantities of obsolete pesticides in Zambia

Item	Location	Pesticides	Amount *(tonnes)*
1	Lusaka ZCF	Various mixtures of pesticides, (soil and metal drums)	300
2a	Mazabuka Vet. store	Metal canisters labelled "Diazino"	3.4
2b	Mazabuka Vet. store	DDT & contaminated soil	15
2c	Mazabuka Vet. store	Endosulfan	0.6
3	Senanga, Zambia Police St.	Endosulfan	0.6
4	Ndola town	Dinitro-O-Cresol 20%	14.4
5a	Nchanga/Kitwe farm	MCPA and other pesticides	0.6
5b	Nchanga/Kitwe farm	Ethylene-dibromide 1800 g/l	0.025
6	Mpongwe/Luanshya	Various unidentified pesticides	1.5
		Total	**336**

joint disposal of ±340 tonnes of obsolete pesticide stocks. About 270 to 300 tonnes of the total are stored in the compound of the Zambia Cooperation Federation (ZCF). The operation is expected to start early in 1997. The breakdown of the obsolete pesticides and the different sites affected are shown in Table 3 and on the map of Zambia (Figure 5).

Planned activities in the near future

- A pilot disposal operation in a third country, Seychelles, is to be undertaken in 1997.
- A disposal project has been formulated for four Sahel countries, the Gambia, Mali, Mauritania and Senegal, with possible financial assistance from the European Union.
- Project portfolios have been prepared for 13 countries, Burkina Faso, Cape Verde, the Gambia, Mali, Mauritania, the Niger, Senegal, Eritrea, Ethiopia, the Sudan, Madagascar, Mozambique, Seychelles, in anticipation that financial backing may be secured from donors.
- A workshop on obsolete pesticides is being organized for the Southern African Development Community (SADC) countries including a few countries from East Africa. The aim is to initiate a common policy on disposal and prevention of accumulation of obsolete pesticides for the region.

Obsolete pesticides in general

Considering the enormity of the task and the large number of countries affected, activities undertaken to date with regard to obsolete pesticides are considered to be in their very early stages. Although the current focus of the project is in countries in Africa and the Near East, continuous requests for assistance are also being received from other regions. Unfortunately, the project budget does not make it possibleto cater satisfactorily to the needs or requests of any such countries.

Chapter 2

Update on FAO activities

A. Wodageneh

BACKGROUND

Most developing countries are left with large stocks of obsolete pesticides. Generally, these are leftover pesticides that can no longer be used because they have deteriorated as a result of prolonged storage, or because their use was banned while they were still in store. Particularly in Africa, a large proportion of the obsolete pesticides are leftovers from pesticides that countries obtained under aid arrangements.

Most of the stocks are kept in substandard stores and are in a deplorable state, with many containers leaking. If adequate action is not taken, many of the obsolete pesticides currently kept in developing countries will end up in the environment. The implications for public health and the environment can be severe, particularly where groundwater or rivers are being contaminated. The situation is of particular concern where storage sites are located in urban areas or near irrigation schemes or rivers. Point-source environmental contamination with concentrated pesticides may cause a major setback to the development of the area concerned.

The main causes of accumulation of obsolete pesticides are: inadequate storage facilities and poor stock management; overstocking of pesticides, often as a result of excessive donations; unsuitable products (not effective or wrong formulation) or unsuitable packaging (inappropriate size or not durable); and banning of pesticides that are still kept in store. In many cases, accumulation of obsolete pesticides could have been prevented by better planning of requirements, better selection of products and/or better stock management and storage.

Generally, in developing countries there are no safe and environmentally sound disposal facilities for obsolete pesticides.

FAO PROJECT: PREVENTION AND DISPOSAL OF OBSOLETE PESTICIDE STOCKS IN AFRICA AND THE NEAR EAST

Since the early 1990s, FAO has received an increasing number of requests for advice or assistance from its member countries for help to solve problems related to obsolete pesticides. This led to the establishment of project GCP/INT/572/NET, "Prevention and Disposal of Obsolete Pesticide Stocks in Africa and the Near East: Phase 1", funded by the Government of the Netherlands. The project aims to prevent further and unnecessary accumulation of obsolete pesticide stocks, to quantify the problem of obsolete pesticides, to demonstrate the feasibility of disposal operations and to enhance broad involvement of aid agencies in eliminating obsolete pesticides from Africa and the Near East. The project became operational in July 1994. Its main activities include:

- Inventory of obsolete pesticide stocks in Africa and the Near East.
- Promotion of preventive measures to avoid accumulation of obsolete pesticides. To this end the project prepared, published and distributed *Provisional guidelines on prevention of accumulation of obsolete pesticide stocks* and *Pesticide storage and stock control manual.*
- Review and assessment of various disposal methods. This resulted in the *Provisional guidelines on disposal of bulk quantities of obsolete pesticides in developing countries* which were prepared in collaboration with UNEP and WHO.
- Implementation of pilot disposal operations to establish the feasibility of pesticide disposal operations.
- Initiating and facilitating disposal operations at the request of governments and aid agencies. This may include advice, preparatory visits, assistance in acquisition of funds, monitoring of operations, or even implementation of operations.
- Promoting donor cooperation and coordination in pesticide disposal operations.

CURRENT DEVELOPMENTS

Inventories

Late in 1994, FAO commenced its inventory of obsolete pesticide stocks in Africa and the Near East. By May 1996, detailed figures had been collected from about 35 countries. Extrapolation of these figures leads to an

overall estimate of 15 000 to 20 000 tonnes of obsolete pesticides in Africa, excluding contaminated soil, containers and other materials. A general summary of the inventory results is presented in Table 1, p. 7.

The inventory details have been processed into a database which contains information on individual obsolete products (e.g. formulation, container type, age and origin). For each country, indications are provided of storage conditions and associated risks to the environment and human health. A printout of the inventory was distributed. It was emphasized that the data in the inventory were provided by governments. They have not been verified and it is possible that more stocks exist. Several products on the list require analysis to determine whether they are actually obsolete or whether they can still be used.

FAO also collected figures from other countries, particularly in Asia and Eastern Europe. Several countries in these regions have obsolete stocks in excess of 5 000 tonnes each. The total of obsolete pesticide stocks in non-OECD countries is expected to be far in excess of 100 000 tonnes. In addition, there are large quantities of heavily contaminated soil that should be regarded as hazardous waste.

The main conclusions emerging from the inventories are:

- there are vast quantities of obsolete pesticides in developing countries;
- obsolete pesticides include large stocks of organochlorine compounds whose use has been banned for environmental and public health reasons (e.g. dieldrin, DDT, HCH);
- obsolete pesticide stocks include significant quantities of highly toxic organophosphorus compounds (WHO Class Ia and Ib);
- many of the obsolete pesticides are in a deplorable state and pose a severe threat to the environment and public health;
- pesticide stores are generally substandard and are often located in or near urban areas or close to water bodies (ports, irrigation schemes, rivers);
- in the locust zone, obsolete stocks include large strategic stocks for locust control, several of which are more than 20 years old.

Technical feasibility of disposal operations

At present, high-temperature incineration is the preferred option for bulk quantities of obsolete pesticides. Because of the limited possibilities in developing countries, in most cases the recommended method will be shipment of the pesticides to a dedicated hazardous waste incinerator in an industrialized country. For further details reference is made to the *Provisional guidelines on the disposal of bulk quantities of obsolete pesticide stocks in developing countries.*

Pilot disposal projects carried out by FAO and other agencies have established that shipment of obsolete pesticides to incinerators in Europe is technically and financially feasible. Table 4 provides an overview of successfully completed pesticide disposal operations conducted by FAO and other agencies.

Cost indications

For quantities larger than 50 tonnes total disposal costs are in the order of US$3 000 to $4 500 per tonne. This price includes preparation, materials, repackaging, shipment and incineration of obsolete pesticides, as well as monitoring by an independent consultant. Actual costs depend on several factors, such as the total quantity of obsolete pesticides; the number and type of products; the condition of products; the extent and nature of contamination; the number of sites and the distances between them; and the distance from a seaport. Table 5 provides some examples.

TABLE 4

Pesticide disposal operations: completed and ongoing

Year	Country	Product	Quantity *(tonnes)*	Agency
1991	Niger	Dieldrin	60	USAID/GTZ/Shell
1993	Uganda	Dieldrin	50	FAO/UNCDF
1993	Madagascar	Dieldrin	70	GTZ
1994	Mozambique	DDT/monocrotophos	160	GTZ
1995	Zanzibar	Various	280	DGIS/USAID
1996	Yemen	Various	260	FAO/DGIS/KfW
1996	Tanzania	DNOC	55	GTZ
Commenced	Zambia	Various	330	FAO/DGIS/GTZ

TABLE 5
Examples which offer an indication of costs

Country	Quantity *(tonnes)*	All-in costs *(US$ million)*	Price per tonne *(US$)*	Products	Sites	Port	Contamination
Uganda	50	0.2	4 000	1	1	far	little
Zanzibar	280	1.0	3 800	many	20	near	little
Yemen	262	1.0	3 500	many	20	near	severe
Zambia*	336	1.2	3 600	many	6	far	severe

Note: Costs include: preparatory visits and other preparations, analysis of samples, supply of all materials and equipment, supervised repackaging, local expenses, shipment, incineration and auditing/monitoring by an independent expert.
* Estimate.

Quantities smaller than 50 tonnes are relatively more expensive. A quantity of 10 tonnes may cost up to US$80 000, depending on its location.

Pesticide disposal companies

Commercial incineration companies in Europe are increasingly showing interest in pesticide disposal operations supported by aid agencies. Contracts for disposal operations in Zanzibar and Zambia were tendered and attracted three and two bidding companies respectively.

Portfolio of disposal projects

As requested by the First Consultation meeting (Annex I), FAO is building up a portfolio of pesticide disposal projects to facilitate donor involvement in this field. A number of project briefs have been prepared on the basis of FAO's inventories of obsolete stocks in Africa and the Near East. For each country, they contain details about the size and nature of the stock, the origin of individual products, the condition of storage sites and associated hazards, and an indication of disposal costs based on available information.

Detailed written proposals can be prepared at the specific request of governments or aid agencies. Generally, preparation of a such a proposal involves a field visit and inspection of stocks.

FAO tries to match developing countries which request assistance with relevant aid agencies.

Chapter 3

The work of other agencies and organizations relating to prevention and disposal of obsolete and unwanted pesticide stocks

GERMAN AGENCY FOR TECHNICAL COOPERATION (GTZ)

Preliminary report on the DNOC disposal in the United Republic of Tanzania

GTZ has a pesticide disposal project which has been running since 1991. Its key objective is the development of concepts and proposals for the disposal of obsolete pesticides and their containers in an environmentally acceptable manner. For detailed information about this project reference is made to the report of the First Consultation meeting on the prevention and disposal of obsolete and unwanted pesticide stocks in Africa and the Near East, held from 12 to 14 December 1994.

Objective

The aim of the project was the environmentally sound disposal of obsolete pesticides in Africa in the country of origin of the waste (Tanzania) by using existing incineration facilities (cement factory).

Incineration in a cement kiln is not suitable for all pesticide types, many of which can only be incinerated in a dedicated high-temperature toxic waste incinerator with sophisticated emission controls. DNOC is potentially suitable for incineration in cement kilns because of its specific structure.

The benefits of dealing with the waste in an acceptable manner in the country of origin include the elimination of hazards and costs associated with repackaging and intercontinental transportation.

Execution

International Red Locust Control Organization for Central and Southern Africa (IRLCO-CSA) and Pesticide Disposal Project of the GTZ in cooperation with Twiga Portland Cement Co. Ltd and with the support of various Tanzanian government entities.

Time schedule

June 1992 to July 1996.

Procedure

1. Careful assessment of the DNOC as to quantity, quality, storage and transport conditions, site evaluation, acute hazard assessment etc.
2. Safeguarding measures at seven storage sites for 71 000 litres of DNOC.
3. Finalization of the disposal concept development including testing of DNOC incineration conditions, evaluation of the facilities at the cement factory, design of the Waste Introduction System (WIS), construction of the WIS at Dar-es-Salaam University, involvement of a Tanzanian steel mill for the destruction of the DNOC containers.
4. Transportation of the DNOC within Tanzania to the Twiga Cement Factory near Dar-es-Salaam from five storage sites.
5. Installation and testing of the WIS at the cement factory.
6. Incineration of 57 600 litres of obsolete DNOC in the cement kiln.

Problems encountered

- DNOC from Zambia was not included;
- difficulties in planning and timing approaches;
- uncertainties about administrative approval procedures and the different responsibilities of the various government agencies involved;
- dependence on the work plan of the cement factory;
- perception of the disposal operation, e.g. by government employees or workers at the cement factory. Incineration work was stopped at one point because of the concerns of workers at the factory, but recommenced when they were reassured;
- technical problems with the WIS.

Results

In total 98 000 litres of DNOC-Diesel mixture were incinerated. More than 450 steel drums were rinsed and 400 of these were melted at the steel mill. The remaining drums were given to the Tanzanian Ministry of Agriculture for their use.

The WIS was handed over to the Twiga Portland Cement Co. Ltd for possible use in similar future operations.

Clinker from the cement kiln and dust were tested for DNOC residues and none were found. The total cost of the operation was 350 000 DM, or approximately US$240 000; that is $4 167 per tonne.

In line with GTZ's objectives, which include development of concepts and proposals for the disposal of obsolete pesticides and their containers in an environmentally acceptable manner, a total of 57 600 tonnes of DNOC has been disposed of in a cement kiln in Tanzania without incidents.

THE NETHERLANDS FOREIGN MINISTRY (DGIS)

Mr J.O. Verboom of DGIS stated that the Netherlands supports the implementation of an integrated approach to the solution of the problem of obsolete pesticide stocks. This includes support for projects which generate long-term prevention measures to avoid future accumulation of obsolete pesticide stocks. The Netherlands currently supports several integrated pest management (IPM) projects. The Netherlands also supports the prior informed consent (PIC) process and has supported disposal operations in Yemen, Zanzibar, Zambia and Seychelles. In the latter two cases, operations will start in the first half of 1997.

Mr H.P. van der Wulp, who had assisted the Government of the Netherlands in preparing and monitoring the disposal operation in Zanzibar, made a presentation about that operation.

The operation involved about 280 tonnes of pesticides, industrial chemicals and old school chemicals that were collected from over 20 sites on the islands of Zanzibar and Pemba.

The operation took place in the period September to November 1995 and had to be interrupted for a few weeks in October because of the unstable situation as a result of elections. The operation was a turnkey one involving high-temperature incineration at Rechem UK. The company had been selected through an international tender procedure. The costs of the operation were just under US$1 million which included the turnkey contract with the selected company, local expenses and consultancy assistance in preparing and monitoring the operation. Not included in the total were: overheads at DGIS; staff time of the Dutch coordinator of a Dutch project on Zanzibar providing assistance to the Department of Environment (NADE); and costs of inventories of obsolete chemicals on Zanzibar conducted since 1987.

Some lessons learned

- A three-day preparatory training course for all national staff involved appeared very useful. Modules included: first aid; establishing a safe working area; ergonomic lifting and moving of heavy packages; international regulations with regard to the transport of hazardous materials; product knowledge/hazard assessment; and personal protection.
- The period between the signing of the contract and the commencement of operations was only one month. This was possible largely because Rechem paid its shipping agent to fly to Dar-es-Salaam to arrange all clearances. The clearing procedures went very fast and such an action is recommended for future operations.
- When inspecting the materials for repackaging the pesticides the consultant found that the Flexible Intermediate Bulk Containers (FIBCs) for the repackaging of solids and contaminated soil did not meet International Maritime Dangerous Goods (IMDG) Code criteria. The problem was overcome by flying in liners and obtaining documentary proof of United Nations approval of the bags with liners.

EUROPEAN COMMISSION DG VIII

EC-DG VIII is concerned with the provision of aid from the European Union to African, Caribbean and Pacific States (ACP) in partnership agreements governed by the Lomé Convention.

Over the past two years the Commission has been working with the assistance of the Pesticides Trust to develop guidelines and strategies to ensure that dependence on pesticides in recipient countries is reduced as far as possible. This will be achieved primarily by implementing IPM strategies in projects funded by the EC and by promoting the adoption of IPM policies in recipient countries.

The first phase of this work, culminating in the production of a set of guidelines and briefings, was completed in January 1996 and launched in a

consultation meeting of Commission officials, ACP country delegates and experts in the implementation of IPM in development programmes.

Phase two has recently been approved and work will continue to implement the guidelines in a sample of Lomé Convention countries and throughout the Commission.

Recognizing that the legacy of past practices remains in the form of obsolete pesticide dumps in many developing countries, the Commission is now planning to help find solutions to this problem. A disposal operation is currently being planned to remove obsolete pesticide stocks from Cape Verde, Senegal, Mauritania and the Gambia.

It is hoped that this work will be supported by the pesticide industry and the Commission looks to FAO to coordinate activities in this area. It is also prepared to consider applications from other ACP countries seeking assistance for the disposal of obsolete pesticide stocks.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA)

Course on Pesticide Disposal in Developing Countries

Ms J.K. Jensen of USEPA said that a regional international training course is being developed under USEPA to assist developing countries with pesticide disposal problems. The first draft of the course student manual was given to selected Consultation participants for review and comment. Tentatively, the course will be pilot tested and validated in a Central American country, probably Guatemala, in February 1997.

The purpose of the course, designed to last four and a half days, is to inform participants of disposal options and to provide practical experience by working through both hypothetical and real-life case-studies. More specifically, the objectives of the course are to:

- introduce students to options available for the disposal of bulk quantities of pesticides;
- provide a basic technical, legal and logistical framework for them to make informed decisions;
- develop in-country and regional expertise for pesticide disposal;
- provide guidance to avoid pesticide disposal problems in the future.

The course is designed to teach participants how to: conduct and evaluate pesticide inventories;

- select management and disposal options;
- dispose of empty containers;
- protect workers entering storage sites;
- clean up storage sites;
- develop a risk-communication strategy for the selected disposal option;
- prevent the buildup of unwanted stocks in the future.

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT (USAID)

Ms G. Huden of USAID reminded the meeting of the possibility of transferring excess pesticide stocks from countries where they are considered unwanted to other countries which can make use of them. Termed "triangulation", this practice has been supported and funded by USAID in a number of instances. Triangulation makes available surplus products where required which otherwise would have become obsolete. An investment in repacking and transport saves disposal costs for the country of origin and procurement costs for the country of destination.

Circumstances for such transfer operations were discussed during the First Consultation meeting in 1994.

THE PESTICIDES TRUST

Mr M. Davis said that FAO's activities in the area of prevention and disposal of obsolete and unwanted pesticide stocks from Africa and the Near East are welcomed and they should continue for as long as the problem continues to exist. Particularly commendable is the fact that FAO has addressed the issue of prevention before providing the cure, in that guidelines on the prevention of accumulation of unwanted and obsolete pesticide stocks and on storage and stock management preceded the guidelines for disposal.

The scale of the problem as illustrated by the inventory prepared for this meeting by FAO is huge and, while it is sincerely hoped that the problem is finite, its ultimate solution will require a great deal of effort and some considerable time.

The resources needed to solve this problem are enormous. Scarce funds which could be used for development are being diverted literally to burn the errors of the past. The responsibilities of industry and donors in creating the problem through erroneous practices should not be overlooked. Supply of unregistered products, overstocking, wrong products, unusable formulations, inappropriate packaging, duplicate supplies and other poor practices have all contributed to the creation of obsolete and unwanted

pesticide stocks. Industry and donors must not shirk their responsibilities in providing solutions to the problem of obsolete pesticide stocks which they played such a major part in creating.

FAO's activities thus far have focused on Africa and the Near East but it should not be forgotten that significant obsolete and unwanted pesticide stocks exist in other regions of the world including Asia, South and Central America and Eastern Europe.

The FAO guidelines for the disposal of unwanted and obsolete pesticides allow for new developments in technology and management methods for their elimination, but the most widely accepted method in the guidelines as well as at this meeting is high-temperature incineration. In the vast majority of cases this entails transportation to dedicated incinerators in northern countries, primarily the United Kingdom, and in some cases cement kilns have been used and are proposed for use.

Transportation of toxic waste for incineration is not a faultless solution. There are risks involved in the transportation of toxic waste materials, there are documented environmental risks associated with high-temperature incineration of organic compounds such as pesticides and there is ongoing and increasing political opposition to this strategy. It is not acceptable, in solving the health and environmental problems in developing countries, to create new, similar problems in developed countries receiving the waste.

New technologies and management methods should be actively investigated to find any which are safe and effective and which can be implemented in developing countries. Their cost-effectiveness is clearly an important factor but, in assessing this, it is worth taking account not only of obsolete and unwanted pesticide stocks but also of other toxic waste materials such as persistent organic pollutants (POPs) which require safe destruction. FAO, as the lead organization in this process and the producer of guidelines for the disposal of unwanted and obsolete pesticides, should actively investigate options other than intercontinental transport and incineration.

In order to prevent similar waste problems from arising in the future efforts need to be directed at minimizing the procurement and use of pesticides. To this end the Pesticides Trust is operating in a number of areas:

- working with the European Commission to develop guidelines for the promotion of IPM in commission-aided agricultural programmes;
- assisting in the development of organic cotton production in West Africa;
- providing information to farmers to allow them to make more informed decisions on pesticide use;
- encouraging and providing strategies for low-input public land management in the UK;
- participating in and promoting international action to eliminate the production and trade in particularly hazardous pesticides, to control the trade in pesticides and promote IPM and other low input agricultural systems.

INTERNATIONAL GROUP OF NATIONAL ASSOCIATIONS OF AGROCHEMICAL MANUFACTURERS (GIFAP)

The role of industry

Mr P. Natkanski said that approaches had been made in the past for industry to become involved in the provision of solutions for the problems arising from obsolete and unwanted pesticide stocks. The pesticide industry had felt unable to respond to these approaches without knowing the scale of the problem to be addressed.

FAO has prepared an inventory of obsolete and unwanted pesticide stocks in Africa and the Near East. As a result, GIFAP, representing the major world pesticide manufacturers, has called upon its member companies to consider how they might assist in providing a solution to the problem.

GIFAP supports the FAO approach of dealing with the problem of obsolete and unwanted pesticide stocks on a country-by-country basis; a single project to try and clear a whole continent would be unmanageable.

GIFAP was also pleased to note that funds are being sought and offered from sources other than industry for the provision of solutions.

As a result of FAO's publication of the inventory of obsolete and unwanted pesticide stocks in Africa and the Near East, a meeting between GIFAP and FAO was held in Rome on 30 August 1996. The conclusions of the meeting were as follows:

- the inventory will be circulated to all GIFAP members;
- companies will outline their intentions, which may include funds, technical assistance or the provision of facilities to assist in the disposal of obsolete and unwanted pesticide stocks from Africa and the Near East. These intentions were to be provided to GIFAP by the end of October or early November 1996;
- GIFAP will assemble a coordinated industry response to FAO.

GIFAP would prefer to avoid unilateral responses from pesticide manufacturing companies, believing that a coordinated response would be a great deal more effective.

Non-industry donors asked how they might tap into industry assistance to support programmes which they are funding. GIFAP responded that the form of industry contributions needs to be assessed before any commitments can be made. The donors asked to be kept informed of the agenda between FAO and GIFAP.

Asked whether the industry response to this request for assistance would be a one-off contribution to absolve industry of its responsibilities in other regions or in future problems, GIFAP responded that it did not expect industry's response to be different in the case of future requests for assistance from FAO in this area.

INTERNATIONAL REGISTER OF POTENTIALLY TOXIC CHEMICALS (IRPTC)

Ms B. Bender said that IRPTC operates in the framework of the United Nations Environment Programme (UNEP) to provide information about chemicals to any who require it. In particular, this is of use to developing countries which may not have well-developed chemical management capacities.

The most recent development in this area is IRPTC's establishment of a series of Internet home pages as follows:

- UNEP/IRPTC on http://irptc.unep.ch/irptc/ describes the IRPTC mandates, major activities and functions that ensure the sound management of toxic chemicals and waste. Users will also gain access to the IRPTC databank on chemicals, the Screening Information Data Sets (SIDS), users' manuals for the IRPTC-PC databank system and new publications as they become available.
- Prior Informed Consent (PIC) and the London Guidelines on http://irptc.unep.ch/pic/ contains reports and documents related to the FAO/UNEP mandate to implement the PIC procedure and ongoing negotiations to develop a legally binding instrument on PIC. It also contains a list of chemicals and pesticides subject to PIC.
- Persistent Organic Pollutants (POPs) on http://irptc.unep.ch/pops/ informs users on issues and the progress made by countries and international organizations to initiate action to reduce or eliminate emissions and discharges of POPs. Users can also learn more about the recommendations which may lead to the development of a legally binding instrument on POPs.
- Pollutant Release and Transfer Register (PRTR) on http://irptc.unep.ch/prtr/ describes the collaboration and activities of the international, national and non-governmental organizations (NGOs) on the PRTR and the benefits and use of the PRTR system to track emissions and waste transfers for better management of chemicals. PRTRs are based on the principle of the community's right to know.

Chapter 4

The obsolete and unwanted pesticides problem in the Sahel region

Dr Abou Thiam said: The Pesticides Action Network Africa, which has recently opened its office in Dakar, is pleased to attend this meeting on obsolete pesticides in developing countries.

The statement, slides and video presentations we have seen this morning demonstrate that the health and environmental problems caused by these toxic wastes are becoming widely recognized. We would like to thank FAO for its efforts over the past two years in relation to these issues in general and Africa in particular.

We believe that we are now in a good position to implement important action to solve this difficult and complex problem. To do this all the parties involved must take their share of responsibility. We are particularly pleased that the pesticide industry is considering its participation in the process.

In attempting to solve the problem of obsolete pesticides we should at the same time think about mechanisms, strategies and approaches for preventing the same problems from arising in the future. In other words, prevention is very important.

The Pesticides Action Network Africa will fully participate in initiatives in this area.

The situation regarding obsolete pesticides in the Sahel countries, where a lot of dieldrin is stored under very bad conditions, calls for urgent action. We are happy that FAO, the Permanent Interstate Committee for Drought Control in the Sahel (CILSS) and the EU are in the process of starting disposal projects in some Sahel countries.

We call on donors, industry, international agencies, regional institutions and governments to consider this problem seriously and to give it special attention.

We are convinced that FAO will continue to pay attention to the issue and with the help of all partners will continue to implement and coordinate activities in this area. We hope that decisive steps will be made in the near future.

FAO added the following: Most obsolete pesticides in the Sahel region are leftovers of pesticide donations. A large proportion are 20- to 40-year-old stocks once owned by the regional organizations for migratory pest control, OCLALAV (locust control) and OICMA (bird control). After the abolition of OICMA and the change of mandate of OCLALAV, national governments inherited these stocks. In addition, there are substantial volumes of leftovers of pesticides donated during the 1986 to 1989 locust upsurges.

Stocks also include substantial volumes of old and highly toxic organophosphorus compounds. Severe leakage of old stocks is widely occurring and most storage sites are located in urban areas.

Pesticides became obsolete for various reasons, including: banning of the use of old organochlorinated products that were still being kept in store; substandard stores and poor store management; prolonged storage after overstocking as a result of poor assessment of needs and excessive donations; and provision of inadequate products.

If adequate action is not taken, it must be anticipated that many of the obsolete pesticides currently kept in the Sahel region may sooner or later end up in the environment. Already obsolete pesticides are disappearing as a result of leakage or theft. In Mali and Chad large quantities of dieldrin may have leaked into the soil after drums were destroyed during civil upheavals. The environmental impact of leaked concentrated pesticides is far worse than the impact of the normal intended use of those products. The implications for public health and the environment can be severe, particularly if groundwater or rivers are being contaminated. The situation is of particular concern if storage sites are located in urban areas or near irrigation schemes or rivers, which, unfortunately, is often the case. Point-source environmental contamination with concentrated pesticides may cause a major setback to the development of the area concerned. Both acute poisoning as a result of direct contact with obsolete pesticides and chronic poisoning through intake of contaminated water or food are realistic possibilities. Scarce natural resources such as

fish stocks and drinking water may be significantly affected.

The risk that new stocks will accumulate in the Sahel region has been reduced through a package of preventive measures that are already being taken by the countries concerned. This includes: increased emphasis on integrated pest management; better assessment of pesticide requirements; and reduction of pesticide needs for locust and grasshopper control through better monitoring of their behaviour and population development. Moreover, the majority of the stocks concern very old persistent pesticides. Once these have been eliminated they will not be replaced. The CILSS countries have put in place a common pesticide registration scheme that will prevent the importation of persistent and environmentally dangerous pesticides. The chance that large volumes of new products might accumulate in the future is further reduced by present donor policies to be more careful about pesticide donations and avoid excessive donations.

Chapter 5

Innovative technologies

J.K. Jensen

This paper gives a general overview of innovative treatment technologies that are currently being developed in the United States. The United States Environmental Protection Agency (USEPA) defines innovative treatment technologies as those that lack cost and performance data necessary to support their routine use. In general, a treatment technology is considered innovative if it has experienced only limited full-scale application. Most of the innovative treatment research in the United States is focused on remediation of relatively low levels of specific contaminants from environmental media such as air, soil, waste water, and groundwater. For the reasons outlined below, only minimal research on innovative disposal technologies for concentrated, industrial-strength chemicals, such as unwanted pesticide stocks, is currently being conducted.

Innovative technologies that could potentially be used for the disposal of obsolete pesticide stocks or contaminated environmental media can be grouped into three categories:

- those that destroy the pesticide, such as chemical dechlorination, photocatalytic oxidation and bioremediation;
- those that extract the contamination from specific environmental media, such as thermal desorption;
- those that simply contain or immobilize the contamination in place, including solidification, stabilization, vitrification and molten technologies.

Innovative remedies such as dechlorination destroy the molecule by removing chlorine. Technologies that extract contamination such as thermal desorption may use a chemical solvent or heat to remove the pesticides from soil, groundwater or other media. Technologies that immobilize unwanted pesticides may stabilize the pesticide by using a substance, such as cement, that will bind with and solidify the concentrated pesticide. Several innovative treatment and disposal technologies are briefly described below. These technologies are discussed in terms of the type of substance (e.g. contaminated soil or contaminated water) that has been treated and studied.

Chemical dechlorination

This process destroys or detoxifies certain organochlorine pesticides in contaminated soils by gradually removing chlorine atoms. The conditions that most commonly determine the efficacy and cost of dechlorination methods include the size of soil particles, the soil's moisture content, the organic carbon content of the soil and the clean-up levels required. This technology appears to overcome limitations of its two main predecessors, namely treatment with alkaline polyethylene glycol (APEG) and potassium polyethylene glycol (KPEG), as these technologies require expensive reagents, extensive soil pretreatment, long retention times and possibly incomplete dehalogenation.

The USEPA developed the base catalysed decomposition (BCD) process to detoxify chlorinated compounds such as polychlorinated biphenyls (PCBs) and dioxins. It uses two different technologies: thermal desorption followed by a chemical process to separate and detoxify organic contaminants. It is an efficient, relatively inexpensive treatment process and potentially capable of treating chlorinated compounds at virtually any concentration. However, the process can be expensive for high concentrations because it requires a large dose of chemicals to react with the chlorine. Field data on the performance and cost of BCD for organochlorines are very limited. The BCD chemistry has been used to destroy up to 100 000 ppm of PCBs in dielectric fluids and is claimed to have totally dechlorinated 2,4-D and 2,4,5-T at 10 percent starting concentrations.

Photocatalytic oxidation

This is an effective method for treating aqueous hazardous wastes. Photocatalytic oxidation utilizes a photochemical reaction, rather than a thermal process, to destroy harmful contaminants. Either natural sunlight, a resource usually abundantly available in most developing countries, or artificial ultraviolet (UV) light can be used to activate a catalyst, thus initiating the destruction/reduction process. The

process is relatively simple, using a UV source (either natural sunlight or UV lamps), a catalyst, such as titanium dioxide (TiO_2), and piping to hold the contaminated water. The TiO_2, which is either added to the waste water to form a slurry or fixed to a lattice-type structure, is a semiconductor and an effective catalyst because it does not become depleted during reactions, nor is it toxic.

Photocatalytic oxidation has the following advantages:

- it destroys organics, such as aldicarb, aldrin, dieldrin and PCBs;
- it destroys contaminants on site;
- it is relatively non-power intensive if sunlight is used;
- it is cost-effective compared with other conventional technologies;
- it provides an alternative to incineration.

However, its major disadvantage is that photo-oxidation is designed for decontaminating aqueous hazardous wastes, such as those found in groundwater or waste water, rather than concentrated organic pesticides typically found in developing countries.

Bioremediation

This technology is being studied mainly as a way to clean up contaminated soils, although it can be used to treat aqueous solutions. Bioremediation refers to the breakdown of contaminants into less-harmful and usually less-toxic components by natural micro-organisms. Bioremediation occurs at a higher rate in the presence of oxygen, or more slowly under near oxygen-free conditions. Results of lab studies and environmental monitoring for historical organo-chlorine pesticides like DDT and BHC indicate that they biodegrade in the environment but at a very slow rate. To date, the USEPA has not found a bioremediation process that can accelerate the biodegradation of organochlorines to a rate necessary to make such a process commercially viable for use in site clean-ups. Similarly, limited information from field work on the biodegradation of dioxin has shown that the process can be significantly lengthy.

For the last 20 years, pesticides have been designed to degrade in the environment, and a considerable amount of information is available on degradation kinetics in soil and water at application concentrations. Less information is available on bioremediation of sites contaminated by accidental releases. Many "modern" pesticides contain a chemical bond that can be hydrolysed by microbes or abiotic reactions to yield less-toxic breakdown products. In some instances, the products can serve as growth substrates for microorganisms, which lead to "acclimation" or selection of a population of specific degraders that are able to degrade the pesticide at increasing rates. For example, carbamates, dinitrocresol, chlorophenoxyacetates and some organophosphates can serve as growth substrates for soil bacteria. Low-level concentrations of any pesticide known to serve as a growth substrate for bacteria or to stimulate acclimation in soil would be good candidates for bioremediation. However, high-level concentrations of these same pesticides may be toxic to the microorganisms.

Thermal desorption

Thermal desorption can treat contaminated soils by heating the soil at relatively low temperatures between 300° and 1 000° Fahrenheit. The heat separates the contaminants from the soil. The contaminants then require further treatment. The effectiveness and cost of this technology vary and depend on site characteristics, such as the moisture content of the soil and the concentration and distribution of the contaminants. In addition, thermal desorption can generate residues that need to be monitored and may require further treatment.

Solidification/stabilization

Solidification and stabilization technologies focus primarily on limiting the solubility or mobility of contaminants, generally by physical means rather than by chemical reaction. Waste solidification technologies encapsulate the contaminants in a solid material, such as Portland cement or asphalt. Waste stabilization technologies convert contaminants into less soluble, mobile or toxic forms by adding a binder to the waste, such as cement kiln dust or fly ash. Historically, solidification and stabilization technologies have been used to treat metals and other inorganic compounds, not organic compounds such as most obsolete pesticides.

Vitrification

In situ vitrification development began in 1980 as a method to treat soil contaminated with radioactive materials and avoid the problems associated with excavation and transportation. The technology treats contaminated soils *in situ* by converting them into a stable, rigid, glassy product when it cools. Both 4,4-DDT and dieldrin have been reduced from

pretreatment values of 13 000 ppm and 4 600 ppm, respectively, to less than 16 ppm after the completion of a test.

Molten technologies

Similar to vitrification, molten technologies lock contaminants into a matrix. Rather than melting the contaminated matrix, however, molten technologies introduce waste into a molten bath of salts or metals. The bath provides heat for reactions; catalyses organic destruction reactions; and wets, dissolves and/or encapsulates contaminants. With this technology, contaminants are contained through physical/chemical processes; the technology does not rely strictly on high temperatures as incineration typically does. Because molten technologies destroy much of the wastes, significant volume reduction is also achieved.

The molten-salt treatment is accomplished by introducing wastes, along with an oxygen source (air or pure oxygen), into a pool of molten sodium, potassium and lithium carbonates (or other alkaline salts). Operating temperatures are commonly held to 950°C ±50, but may be controlled throughout the range of 700° to 1 200°C. At this operating temperature, the molten salt has a viscosity similar to water. The waste streams introduced can be gaseous, liquid, solid or slurry; however, the maximum particle size must be limited to 3 mm for pneumatic conveying. In general, most waste materials release a sufficient amount of heat to keep the salt bath hot and molten. A few waste streams may require the addition of supplemental fuel. This process has demonstrated PCB destruction efficiencies of greater than 99.9999 percent, with complete removal of the chlorine by-product in the melt. Pesticides and PCBs can be treated with this emerging technology.

Conclusions

Although the USEPA is actively encouraging innovative technologies, it has yet to identify any technologies as effective as incineration for the types of bulk disposal of concentrated unwanted pesticides commonly found in developing countries. However, several innovative technologies are being developed and tested that may some day prove effective, either alone or in combination, in disposing of these pesticides.

Chapter 6

Regulatory aspects

P. Portas

THE BASEL CONVENTION – A GLOBAL WAY FORWARD

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal was adopted in March 1989. This convention became effective in May 1992 and currently has 103 contracting parties, including the European Community. The Basel Convention is the response of the international community to the problems caused by the 400 million tonnes of hazardous wastes generated every year worldwide.

The Basel Convention is first and foremost a global multilateral treaty that strictly regulates the transboundary movements of hazardous wastes and defines the legal obligations of the parties for ensuring environmentally sound management and, in particular, disposal of the wastes.

The convention recognizes that the most effective way of protecting human health and the environment from the danger posed by such wastes is the reduction of their generation to a minimum in terms of quantity and/or hazard potential. This is the underlying philosophy behind the objectives set out in the convention, together with the environmentally sound management of the hazardous wastes nonetheless generated. In this respect, the Basel Convention stipulates three main interdependent and mutually supportive goals that have to be fulfilled:

- transboundary movements of hazardous wastes should be reduced to a minimum consistent with their environmentally sound management;
- hazardous wastes should be treated and disposed of as close as possible to their source of generation;
- hazardous waste generation should be reduced and minimized at source.

Pesticides within the scope of the Basel Convention

Pesticide wastes are identified in the Basel Convention in Annex I, Categories of wastes to be controlled. The Technical Working Group agreed, while developing lists of wastes, to place "waste from the production, formulation and use of biocides and phytopharmaceuticals, including pesticides and herbicides which are off-specification, outdated or unfit for their originally intended use" on the list of hazardous wastes that will be subject to the amendment once it enters into force.

Technical assistance

The Basel Convention is becoming a technical assistance-oriented convention. As part of the activities undertaken by the secretariat, the issue of the management of unused or outdated pesticides has become significant. In this regard, quick actions are required within a strategic framework from the final disposal procurement.

When it comes to dealing with the critical and fast evolving issues of the generation, treatment, storage, transport or disposal of hazardous wastes, a front-line and pragmatic approach is essential. Quick, effective and efficient actions are required to respond to pressing needs.

The secretariat is developing tactical and strategic elements to address hazardous wastes issues. Some key elements are:

- the critical issues concerning hazardous wastes for which measures can be taken now to improve the situation;
- the need to address these issues, including regional or international operation;
- the response capacity of the countries.

In this context, the secretariat would be most interested in working closely with FAO and other IGOs involved in the issues of pesticide wastes.

INTERNATIONAL REGULATIONS

The international legal landscape has changed substantially in the last few years. The Basel Convention is the global instrument dealing with the worldwide movements of hazardous wastes and their disposal.

As recognized in the Basel Convention, regional cooperation is essential to focus efforts and resources on the specific identified needs of a region. As part of

this process, a number of regional conventions, protocols or arrangements have been concluded or are being developed that concern hazardous wastes or include provisions for hazardous waste movement and management.

The secretariat of the Basel Convention was involved during the preparation of the following three conventions:

- the Bamako Convention;
- the Waigani Convention;
- the Draft Protocol for the Prevention of Pollution of the Mediterranean Sea by Transboundary Movements of Hazardous Wastes and their Disposal.

The Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes into Africa, adopted under the auspices of the Organization of African Unity, came into force on 20 March 1996, 90 days after ratification by Cameroon. The significance of the Bamako Convention primarily lies in its being the initiative of the African countries themselves. The concept of African self-reliance and cooperation provides the underpinning of this landmark convention. It is an attempt at harmonizing an African position on global environmental issues. In this convention, there is an obligation for parties to transport hazardous wastes in accordance with established international recommendations, rules, regulations or procedures.

The Waigani Convention, adopted in Port Moresby, Papua New Guinea, in September 1995, bans the importation into South Pacific Forum countries of hazardous and radioactive wastes and controls the transboundary movement and management of hazardous wastes within the South Pacific region. The convention bans the import and export of all hazardous and radioactive wastes and aims to facilitate compliance with the ban by the timely forwarding of all information related to import and export of these wastes to the secretariat of the convention.

The Draft Protocol for the Prevention of Pollution of the Mediterranean Sea by Transboundary Movements of Hazardous Wastes and their Disposal has been developed for the parties to the Convention for the Protection of the Mediterranean Sea Against Pollution, adopted in Barcelona on 16 February 1976. The draft protocol requires parties to prevent and eliminate pollution in the Mediterranean Sea area, to take all appropriate measures to eliminate the generation of hazardous wastes and to minimize the movement of such wastes. The next meeting of the parties to the Barcelona Convention is scheduled for October 1996.

The basis of these international transport directives is the work of the United Nations Committee on the Transport of Dangerous Goods, which is valid for all modes of transport, the IMDG Code of IMO or the ADR (road transport) agreement. In its quest for harmonization of transport rules or criteria, intergovernmental work is taking place under the auspices of the United Nations.

Concerning pesticides, it should be noted that the trend is to use *The WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification, 1996-1997*, produced by the International Programme on Chemical Safety. Industry, for instance, will be asked to classify a pesticide in accordance with its LD_{50} value but will also be invited to consult the WHO LD_{50} criteria. The WHO recommendations are seen as a useful tool for harmonization of toxicity values at the international level.

CONCLUSIONS

The issue of pesticide wastes has to be seen from a strategical point of view in the larger context of hazardous chemical and waste management as well as health-agricultural policy practices although, from a tactical point of view, pesticide wastes will require specific considerations.

The secretariat of the Basel Convention is working with many countries in all regions of the world in reviewing what are the most critical issues regarding hazardous wastes that need to be addressed now to improve the situation dramatically, and pesticide wastes have regularly been identified as one of those critical issues.

This approach is developed within an overall strategic framework that includes legislation, training enforcement and hazardous waste minimization. The secretariat hopes to contribute meaningfully within its limited resources to the efforts of the international community to assist developing countries and other countries in the elimination of obsolete pesticides.

Chapter 7

Policy framework

OECD GUIDELINES ON PEST AND PESTICIDE MANAGEMENT

H.P. van der Wulp

Introduction

Several important international organizations and fora are providing broad policy support for international assistance to help solve the urgent problem of obsolete pesticides in developing countries.

In 1995, the Development Assistance Committee of the Organisation for Economic Co-operation and Development (OECD/DAC) published the *Guidelines for Aid Agencies on Pest and Pesticide Management*, which stated:

"OECD/DAC recognizes the importance of the problem of obsolete pesticides and has given obsolete pesticides a prominent place in these guidelines. Aid agencies are called upon to assist developing countries in preventing further accumulation of obsolete pesticide stocks and in providing technical and financial assistance to disposal operations to eliminate the present obsolete stocks.

- Recipient countries, aid agencies and other donors should take measures to avoid a further accumulation of obsolete stocks.
- Recipient countries, with the assistance of aid agencies, should urgently take the necessary measures to secure present obsolete stocks. This would include repacking all pesticides currently kept in leaking, heavily damaged or corroded containers and arranging for their safe and proper storage.
- Aid agencies should provide analytical services to recipient countries to assist them in determining whether their older stocks can still be used or have become obsolete.
- Aid agencies need to make a concerted effort to provide the required technical and financial assistance for the disposal of current obsolete stocks of pesticides.

INTERGOVERNMENTAL FORUM ON CHEMICAL SAFETY

G. Kanoute

At the Intergovernmental Forum on Chemical Safety (IFCS) in Canberra, Australia, in March 1996, the Africa Working Group met to discuss the serious problem of obsolete pesticides. Many of these pesticides have been in African countries for many years and the containers and packaging have deteriorated to such an extent that there exists a real threat to humans, animals and the broader environment. The key proposals from this working group are summarized below:

- that a small ad hoc task group be formed to steer and coordinate this urgent matter;
- that FAO and other organizations provide records of surveys and inventories to the task group;
- that the funding for clean-up be negotiated between appropriate parties, such as the World Bank, the European Commission, OECD countries and industry;
- that data regarding obsolete stocks be extended to countries not formerly covered and that old data be updated;
- that suitable technology for the destruction of obsolete pesticides be investigated. Australia indicated the availability of new technology not dependent on incineration. Greenpeace can also assist;
- that IFCS acts as a guardian and custodian for the task group in an assisting/enabling role.

The IFCS Working Group on Obsolete Chemicals met during the IFCS meeting in Manila, the Philippines, in June 1996. The key recommendations from this meeting were as follows:

- that IFCS approach FAO to convene a meeting of the Working Group on Obsolete Chemicals to work out a strategy and method of disposal;
- that training courses be developed for inspectors

and other technical personnel in identification, handling and management of obsolete chemicals;
- that guidelines for handling and management of chemicals be developed to prevent stockpiling and contamination of the environment;
- that African countries be given special assistance for the disposal of these chemicals;
- that FAO and UNEP approach the Global Environment Facility (GEF) regarding possible projects for the disposal of obsolete pesticides.

Chapter 8

Round-table discussion

The discussion was introduced by Mr van der Graaff, Chief, FAO Plant Protection Service. He said FAO intends to continue its involvement in this area provided funds are made available for a second phase. He explained that FAO sees its role mainly as initiating, facilitating and coordinating. FAO tries to match requests from member countries for assistance in prevention and disposal of obsolete pesticides with funding possibilities from donors and industry. Facilitating operations could involve technical assistance in preparing disposal operations and auditing the implementation of operations.

Chapter 9

Recommendations

Delegates who attended the Second Consultation meeting on the Prevention and Disposal of Obsolete and Unwanted Pesticide Stocks in Africa and the Near East held in Rome from 2 to 3 September 1996, organized by FAO, renewed their endorsement of the resolution adopted at the First Consultation in 1994 (Annex I) and adopted the following recommendations:

FAO

FAO, in consultation with other interested parties, is requested:

1. To develop criteria for the selection of countries for disposal operations, including criteria for the avoidance of the new accumulation of obsolete stocks.

2. To prepare a checklist of issues to be addressed by those contracting for disposal operations, to enable them to take advantage of the cumulative experience from various organizations.

3. To develop further mechanisms for independent quality assurance of all aspects of disposal operations as activities increase in the longer term.

4. To establish a small working group of interested parties to investigate new and alternative technologies and management methods for the disposal of obsolete pesticide stocks from developing countries. Emphasis should be given to technologies that can be used in developing countries.

5. In cooperation with other appropriate agencies, to broaden the survey of obsolete pesticide stocks to other regions of the world.

6. To link obsolete pesticide disposal initiatives with the development and implementation of programmes related to pesticide management, such as awareness campaigns, institutional capacity building, farmer training and extension training.

7. To develop guidelines to address the problem of small quantities of unwanted pesticides and pesticide containers.

8. In close cooperation with all parties concerned, to work out modalities for contributions to disposal operations .

9. To keep the Intergovernmental Forum on Chemical Safety informed of activities related to the disposal of obsolete and unwanted pesticide stocks.

GIFAP

GIFAP is requested to work out the modalities for financial and technical contributions from agrochemical companies to pesticide disposal operations.

Annexes

1. FIRST CONSULTATION MEETING ON THE PREVENTION AND DISPOSAL OF OBSOLETE AND UNWANTED PESTICIDE STOCKS IN AFRICA AND THE NEAR EAST (12 TO 14 DECEMBER 1994, FAO, ROME)

Summary and Resolution

Over the years, pesticides have been the preferred means of pest control both for crop protection and vector control in animal and public health programmes. Donor agencies and organizations have with good intentions provided pesticides either as grants or as part of various aid components destined to developing countries.

However, because of insufficient coordination of pesticide supply/donations both at national and international level, inappropriate use and poor storage management, lack of expertise in general and the banning of an increasing number of pesticides, many of the very pesticides which were intended to control pests have in due course become obsolete. As a result of prolonged storage, most pesticides have passed their shelf-life, their labels have been lost, damaged or removed and containers corroded, leading to pesticide leakage and seepage, and contamination of the environment. Although the size and number of sites affected each year and the type and variety of pesticides received or identified as obsolete pesticides in each of the developing countries vary from region to region, the seriousness and the overall adverse effects to public health and the basic environmental implications are similar.

Problems related to obsolete and unwanted pesticides are quite common, widespread and alarming, particularly as most developing countries are seriously affected. If the issue remains unresolved and action is delayed, the magnitude and severity of the problem will increase and it will be much more difficult to bring it under control. The damage will be long term and will have much wider implications and incalculable adverse effects on the environment.

As a result of growing international environmental awareness and because of the seriousness and frequency of exposure and widespread pesticide-related accidents, developing countries are under increasing pressure to look for assistance and technical guidance for the disposal of obsolete pesticides. Subsequently, and mainly because of the urgency and continued requests received from affected countries, it became important for FAO to organize a meeting: to discuss the issue and exchange information; to enhance understanding and to initiate harmonization; to encourage and motivate donors; to recognize collective responsibility; and to plan coordinated actions for the disposal of obsolete pesticides. Moreover, it also became imperative to seek a common position on ways and means to avoid further accumulation of obsolete and unwanted pesticide stocks in the future.

Donor countries, organizations and aid agencies represented at the meeting addressed the issue comprehensively. The outcome should be instrumental to a coordinated and concerted international approach.

Therefore, the delegates[1] who attended the consultation meeting held in Rome

[1] The Representative of Japan stated that he could not underwrite the resolution without clearance from the Government of Japan.

from 12 to 14 December 1994 under the auspices of FAO, having the foregoing as a background, and after having discussed among themselves the basic issues and long-term implications of obsolete pesticides, unanimously adopted the following resolution:

- stocks of obsolete and unwanted pesticides are a serious environmental problem with international dimensions;
- a large share of these pesticides are leftovers from pesticide donations provided under aid programmes;
- all major donors and aid agencies in one way or another have been involved;
- the problem of obsolete and unwanted pesticide stocks is an international issue which recipient countries, aid agencies, donor countries and the pesticide industry have a joint responsibility to address;
- reduction and prevention of the generation of hazardous waste is called for in UNCED Agenda 21.

Recipient countries, donor governments, aid agencies and the pesticides industry were called upon to:

- prevent the accumulation of obsolete and unwanted pesticides by implementing the recommendations of the *Provisional guidelines: Prevention of accumulation of obsolete pesticide stocks;*
- support project activities to dispose of existing stockpiles of obsolete pesticides in developing countries and countries in transition in a safe and environmentally sound manner;
- strengthen capacities and capabilities in recipient countries as a primary measure to prevent accumulation of obsolete and unwanted pesticide stocks and in support of the further implementation of the *International Code of Conduct on the Distribution and Use of Pesticides.*

Requests were made to FAO to encourage and enhance cooperation and coordination among parties involved in, or interested in, addressing the problem of obsolete and unwanted pesticide stocks. This should include:

- facilitation of disposal operations for obsolete stocks;
- facilitation of the development and implementation of strategies for the prevention of accumulation of obsolete and unwanted pesticide stocks;
- provision of services as a reference centre for information on pesticide disposal matters;
- organization of meetings as necessary for parties involved in, or interested in, pesticide disposal activities;
- identification of obsolete stocks that require urgent action on the basis of human health and environmental concerns, and initiation of disposal operations and strategies for the prevention of accumulation of obsolete and unwanted pesticide stocks, by bringing together government authorities, aid agencies and other interested parties.

Requests were also made to strengthen the capacities and capabilities of developing countries and countries in transition to prevent accumulation of obsolete pesticide stocks.

2. PAPERS AND MATERIALS PREPARED FOR THE SECOND CONSULTATION

1. Working document for the Second Consultation

2. Inventory of obsolete pesticides in Africa and the Near East

3. Report on the disposal of obsolete pesticide stocks in Yemen

4. Project proposals for the disposal of obsolete pesticide stocks from selected countries (viz. Burkina Faso, Cape Verde, the Gambia, Mali, Mauritania, the Niger, Senegal, Eritrea, Ethiopia, the Sudan, Madagascar, Mozambique, Seychelles)

5. Publications
– Series No. 1: First Consultation meeting, 12 to14 December 1994
– Series No. 2: Prevention of accumulation of obsolete pesticide stocks (Provisional guidelines)
– Series No. 2: Prévention de l'accumulation de stocks de pesticides périmés (Directives provisoires)
– Series No. 3: Pesticide storage and stock control manual
– Series No. 4: Disposal of bulk quantities of obsolete pesticides in developing countries (Provisional technical guidelines)

6. Videos
– GCP/INT/572/NET: FAO Pesticide disposal operation in the Republic of Yemen
– Rechem Zanzibar Report

3. PROGRAMME

Monday, 2 September 1996

9.00-9.30 am
Registration of participants

9.30-9.45 am
Opening and welcome
N.A. van der Graaff, Chief, FAO Plant Protection Service

9.45-10.00 am
Election of Chairman and Rapporteur
Adoption of agenda

10.00-10.30 am
Coffee break

10.30-10.45 am
Introduction to the meeting
Obsolete and unwanted pesticide stocks, guidelines, inventory, Yemen disposal operation, including video presentation
A. Wodageneh, Project coordinator, GCP/INT/572/NET

10.45-11.45 am
Update on activities: FAO
A. Wodageneh, Coordinator; **H.P. van der Wulp,** FAO Consultant

11.45 am - 12.30 pm
Update on activities: GTZ
Including a video/slide presentation on incineration of DNOC in a cement kiln in the United Republic of Tanzania

12.30-2.00 pm
Lunch

2.00-2.30 pm
Update on activities: DGIS
Including a video/slide presentation on the pesticide disposal operation in Zanzibar

2.30-3.15 pm
Update on activities: other agencies

3.15-3.30 pm
Tea

3.30-4.15 pm
The situation in the Sahel region
Abou Thiam, PAN

4.15-5.15 pm
New developments
The development of new disposal technologies
J.K. Jensen, USEPA

Regulatory aspects (Basel; IMDG)
P. Portas, UNEP SBC

5.15 pm
Cocktails

Tuesday 3 September 1996

9.00-10.30 am
New developments (continued)
Policy framework for disposal operations: OECD Guidelines, IFCS, UNEP
Availability of incineration services and experiences in tendering disposal operation
H.P. van der Wulp
Increased involvement of industry:
P. Natkanski, GIFAP

10.30-10.45 am
Coffee

10.45-11.30 am
Discussion on new developments

11.30 am -12.30 pm
Round-table discussion on collaboration and coordination in pesticide disposal, introduced by
N.A. van der Graaff

12.30-2.00 pm
Lunch

2.00-3.30 pm
Round-table discussion (continued)
Drawing up of recommendations

3.30-4.30 pm
Tea

4.30-5.00 pm
Adoption of recommendations
Conclusion and statements by participants

5.00-5.15 pm
Closing remarks
N.A. van der Graaff

4. LIST OF PARTICIPANTS

Bender, B.
Scientific Affairs Officer
UNEP/IRPTC
Case Postale 356 1219
Chatelaine, Geneva
Switzerland
tel. (41 22) 9799187
fax (41 22) 7973460
e-mail: BBender@UNEP.CH

Dale, M.
The European Commission DG VIII
200 rue da la Loi
Brussels, Belgium
tel. (32 2) 2992759
fax (32 2) 2992908

Davis, M.
The Pesticides Trust
Eurolink Centre
49 Effra Road
London SW2 1BZ
United Kingdom
tel. (44 171) 2748895
fax (44 171) 2749084
e-mail: pesttrust@gn.apc.org

Endo, Y.
First Secretary, Embassy of Japan
Via Quintino Sella 60
Rome, Italy
tel. (39 6) 487991
fax (39 6) 4873316

Gysbersten, K.
Ministry of Housing
Spatial Planning and Environment
P.O. Box 30945
The Hague, the Netherlands
tel. (31 70) 3394744
fax (31 70) 3391297

Huden, G.
Environment Centre Global Bureau
US Agency for International Development
Room 509, SA-18 320-21 St, NW
Washington DC 20523-182, USA
tel. (1 703) 8754076
fax (1 703) 8754384
e-mail: GHuden@USAID.GOV

Jensen, J.K.
Policy and Special Project Staff (7501C)
Office of Pesticide Programs
US Environmental Protection Agency
401 "M" St, SW
Washington DC 20460, USA
tel. (1 703) 3057706
fax (1 703) 3056309
e-mail: jensen.janice@epamail.epa.gov

Kanoute, G.
Ministry of Health
Bamako, Mali
tel. (22 3) 225301/225302
fax (22 3) 230203

Kaufmann, W.
Ciba-Geigy Ltd
PP 1.3
Strategic Services Agriculture
CH-400 Z Basel
Switzerland
tel. (41 61) 6977184
fax (41 61) 6974956
e-mail: Walter.kaufmannichbs@mhs.ciba.com

Link, R.
GTZ
Postfach 5180
D-65726 Eschborn
Germany
tel. (49 6196) 791428
fax (49 6196) 797173
e-mail: rolf.link@gtz.de

Natkanski, P.
GIFAP Chairman
International Obsolete Stocks
Project Team
Brussels, Belgium
tel. (32 2) 5420410
fax (32 2) 5420419;
Zeneca Agrochemicals
Environmental Manager
Stewardship Department
Fernhurst, Haslemere
Surrey FV27 3JE
United Kingdom
tel. (44 1428) 655729
fax (44 1428) 657130

Pambianco, M.
European Commission DG Xl.E.2
200 rue de la Loi
1049 Brussels
Belgium
tel. (32 2)2957583
fax (32 2) 2956117

Portas, P.
Secretariat of the Basel Convention
Geneva Executive Centre
15 chemin des Anemones
1219 Chatelaine, Geneva
Switzerland
tel. (41 22) 9799217
fax (41 22) 7973454
e-mail: pportas@UNEP.CH

Thiam, A.
Pesticides Action Network Africa
B.P. 15938
Dakar-Fann
Senegal
tel. (22 1) 254-914
fax (22 1) 254-914
e-mail: pan.africa@enda.sn

Vaagt, G.
Technical Cooperation
GTZ
P.O. Box 5180
D-65726 Eschborn
Germany
tel. (49 6196) 791 082
fax (49 6196) 797 180
e-mail: 101356.3001@compuserve.com

Verboom, J.O.
Ministry of Foreign Affairs
Environment Department DML/BD
The Hague, the Netherlands
tel. (31 70) 3486414
fax (31 70) 3484303

Warris, R.P.
GIFAP
International Obsolete Stocks
Project Team
Brussels, Belgium;
CYANAMID
International Division
Konrad Adenauerstr. 30
Ingeleheim am Rhein
Germany
tel. (49 6132) 789118
fax (49 6132) 789259

FAO

Zehni, Mohamed S.
Director, Plant Production and Protection Division
tel. (39 6) 52255004
fax (39 6) 52256347
e-mail: Mohamed.Zehni@fao.org

van der Graaff, N.A.
Chief, Plant Protection Service
Plant Production and Protection Division
tel. (39 6) 52253441
fax (39 6) 52256347
e-mail: Niek.Vandergraaff@fao.org

Kopisch-Obuch, F.-D.
Senior Officer
Pesticides Group
Plant Protection Service
Plant Production and Protection Division
tel. (39 6) 52255757
fax (39.6) 52256347
e-mail: Friedrich.KopischObuch@fao.org

Hafraoui, A.
Senior Officer
Migratory Pests and Emergency Operations Group
Plant Production and Protection Division
tel. (39 6) 52254021
fax (39 6) 52255271
e-mail: Abderrahmane.Hafraoui@fao.org

Scialabba, N.
Environmental Officer
Environment and Natural Resources Service
Research, Extension and Training Division
tel. (39 6) 52256729
fax (39 6) 52253369
e-mail: Nadia.Scialabba@fao.org

van der Wulp, H.
FAO Consultant
J. van Brakelplantsoen 1
2253 TD Voorschoten
The Netherlands
tel. (31 71) 5322537
fax (31 71) 5322739
e-mail: hwulp@worldaccess.nl

Wodageneh, A.
Coordinator
GCP/INT/572/NET
Plant Protection Service
Plant Production and Protection Division
tel. (39 6) 52255192
fax (39 6) 52256347
e-mail: Alemayehu.Wodageneh@fao.org

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

D/W3338E/1/3.97/500