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The International POPs Elimination Project

*Fostering Active and Effective Civil Society Participation in
Preparation for Implementation of the Stockholm Convention*

Non-POPs Strategies for Crop Protection in Uganda



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About the International POPs Elimination Project

On May 1, 2004, the International POPs Elimination Network (IPEN <http://www.ipen.org>) began a global NGO project called the International POPs Elimination Project (IPEP) in partnership with the United Nations Industrial Development Organization (UNIDO) and the United Nations Environment Program (UNEP). The Global Environment Facility (GEF) provided core funding for the project.

IPEP has three principal objectives:

- Encourage and enable NGOs in 40 developing and transitional countries to engage in activities that provide concrete and immediate contributions to country efforts in preparing for the implementation of the Stockholm Convention;
- Enhance the skills and knowledge of NGOs to help build their capacity as effective stakeholders in the Convention implementation process;
- Help establish regional and national NGO coordination and capacity in all regions of the world in support of longer term efforts to achieve chemical safety.

IPEP will support preparation of reports on country situation, hotspots, policy briefs, and regional activities. Three principal types of activities will be supported by IPEP: participation in the National Implementation Plan, training and awareness workshops, and public information and awareness campaigns.

For more information, please see <http://www.ipen.org>

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The views expressed in this report are those of the authors and not necessarily the views of the institutions providing management and/or financial support.

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LIST OF ABBREVIATIONS

DDT	Dichlorodiphenyltrichloroethane
EIA	Environmental Impact Assessment.
EU	European Union
FAO	Food and Agricultural Organisation (United Nations)
IFPRR	Intercontinental Forum on Pesticides Risk Reduction
IPEP	International POPs Elimination Project
IPM	Integrated Pest Management
IUF	International Union of Food
MRLs	Minimum Residue Levels
NEMA	National Environment Management Authority
NIP	National Implementation Plan
NUPAWU	National Union of Plantation and Agricultural Workers of Uganda.
PIC	Prior Informed Consent
POPs	Persistent Organic Pollutants
PPE	Personal Protective Equipment
SCANAGRI	Scandinavian Countries Agriculture.
SCOUL	Sugar Corporation of Uganda Limited.
SIDA	Swedish International Development Agency
TPRI	Tropical Pesticide Research Institute
UNEP	United Nations Environment Programme
USCTA	Uganda Sugar cane Technologist Association.

1. EXECUTIVE SUMMARY

This project was conducted by National Union of Plantation and Agricultural Workers of Uganda (NUPAWU) in collaboration with the Management staff in charge of Safety, Health and Environment in the Sugar Plantations of Lugazi, Kakira and Kinyara, under the International POPs Elimination Project (IPEP). NUPAWU is affiliated an international trade union, the International Union of Food, Agricultural, Hotel, Restaurant, Catering, Tobacco and Allied Workers' Association (IUF).

The broad objective of the project is to contribute to the implementation of the Stockholm Convention on Persistent Organic Pollutant (POPs) in Uganda and lobby the Government of Uganda to accede the convention. In the middle of the project, however, Uganda acceded to the Convention, but has not yet developed the National Implementation Plan (NIP) to implement the Convention.

Very little is known about POPs in the country except about Dichlorodiphenyltrichloroethane (DDT), through public debates for and against its use in malaria control. This study identified some of the interventions necessary to fill the knowledge gap among the agricultural workers and the public on Stockholm Convention and alternatives to POPs in the areas of study.

The benefit of the project would be to raise awareness among the Union Members, the Management of the Sugar Plantations and the Ugandan public about the problems associated with the use of POPs and also to avail them with the information on alternatives. Secondly the project would assist to develop the National Implementation Plan, give an economic analysis of the alternatives so that the authority can make an informed decision.

The Specific objectives of the Project are:

1. Preliminary inventory of POPs currently in use in Uganda for the crop protection whether registered or not;
2. Non-POPs strategies identified and developed; and
3. Inform the public and key national stakeholders on chemical management, and the Stockholm Convention on POPs and work towards encouraging Uganda Government to accede and implement the Convention.

Our unique approach to this was to study the pests against which the POPs found are being used, including the life cycle and adaptation in order to come up with not only pesticides intervention but with other control methods as well as IPM and then compute the viability of the non-POPs strategies before presenting to the National Environment Management Authority (NEMA) for decision making.

The project team included Mr. Omara Amuko, the Health, Safety and Environment Coordinator (NUPAWU/ IUF); Kefa, Wandera, Francs Mukama, Taaka Wandera (members of NUPAWU Health and Safety Committee); Mr. Anywar Michael Odai the Area Manager Agriculture in SCOUL, /Chairman Safety, Health and Environment in Plantation of SCOUL and the Current Chairman of Sub-Committee on Safety, Health and

Environment for the Uganda Sugarcane Technologist Association (USCTA) and a member of Intercontinental Forum for Pesticides Risk Reduction (IFPRR).

In conclusion, the Government acceded to the Stockholm Convention in July 2004 and our survey could not find any POPs currently used for crop protection in the area of study. However, the project can be later used to contribute in the development and implementing the National Implementation Plan (NIP) for the Stockholm Convention in Uganda.

2. DESCRIPTION OF TOPIC

Weeds, diseases and infestations by insects have always been a major threat in the agricultural production both on cash and food crops, feed and fibre, often giving rise to life threatening periods of famine or causing serious economic loss to the producers. Persistent Organic Pollutants (POPs) Pesticides started to be used on a large scale after World War II in agriculture and for disease vector control in 1950s virtually with the world knowing little about their effects on the environment and the human health.

POPs are chemicals that are extremely stable and persist in the environment, bio-accumulate in organisms and food chains, are toxic to humans and animals and have chronic effects such as disruption of reproductive, immune and endocrine systems, as well as being carcinogenic, and are transported in the environment over long distances to places far from the points of release.

A landmark in public awakening was the publication, in 1962, of *Silent Spring*, in which Rachel Carson eloquently warned against continued unrestricted use of chlorinated pesticides, in particular DDT. Evidence continued to mount in the following decades supporting her fundamental point. Pest control, which ignores ecology not only fails, but creates additional problems affecting health and environment (Carson, 1962).

In large commercial agriculture like the sugar plantations pests and diseases are rampant, destroying crops affecting production both in quality and quantity. This situation has resulted to several efforts that look for control measures to reduce loss.

Cane sugar is a very important part of the diet in our daily life. It is produced (manufactured) in the sugarcane plants and extracted in the mill. Since the demand for sugar is increasing year after year and the land suitable for sugarcane cultivation is limited, efforts are being made to produce more cane per unit area of land. This is done through the intensive use of fertilizers, pesticides and irrigation where available, planting high sugared varieties from other countries and taking three or more ratoons¹. All these factors have caused the sugarcane plants to be damaged more and more by indigenous and introduced pests and diseases. A causal survey of wild and cultivated flora

¹ These are crops that emerge after harvesting of sugarcane plant crop usually under our conditions 2-3 ratoons are taken before the crop is ploughed down

particularly of gramineae family, within the sugarcane plantations of Uganda, has revealed absence of natural enemies of the major pests in the past. Generally the natural enemies keep the pests under check, but in their absence the population of pests continues to rise to enable them cause injury to cane plant and loss in sugar recovery. Indirectly, they allow diseases to gain entry into the cane plant.

Hill and Walker (1982) in their book: Pests and Diseases of Tropical Crops-Principles and Control (Vol.1) which was reprinted in 1984 state that insects multiply very rapidly as each female is capable of laying a large number of eggs, have a short life cycle and several generations in a year particularly under moderate climatic conditions therefore necessitating pesticides intervention. Intervention measures without using pesticides which may include POPs or with minimum pesticides is the desired situation.

3. FINDINGS OF THE STUDY

As per our findings so far no POPs are currently being used in the three Sugar Industries for crop protection purposes.

The use of Grammoxone (Paraquat)² was phased out in the early nineties. Aldrin and Dieldrin were used for termite control, but they are now replaced with another non-POP pesticide, common name Regent 3G (chemical name Fipronil 3g/kg). Current formulation of this chemical is granules with its basic mode of action being bait for termites control both in sugarcane fields and in forestry. However, the study highly suspects that some POPs may be in the remains of some contaminated old store or some of the obsolete stock found in the farms, such as one shown below.



Contaminated old Pesticides store area in a Plantation section at Lugazi. Those remains may contain obsolete POPs stock and their disposal is of concern.

² Paraquat is not among the “dirty dozen”

The study was also working towards the accession of the Stockholm Convention but the Government acceded to it on the 20th July 2004. This means the important thing now is to participate in the development of the National Implementation Plan (NIP) and its subsequent activities. The National Union of Plantation and Agricultural Workers is one of the stakeholders to be involved in the implementation of the NIP. According to the National Environment Management Authority (NEMA), the Focal point of the Convention and government agency charged with its implementation, the NIP is currently at the preparatory stage.

The Crop Protection Division of the Ministry of Agriculture Animal Industry and Fisheries is generally no longer registering most of the POPs. However, at the beginning of 2002, the Ministry of Health has expressed interest in using DDT as an indoor residual spray for control of mosquitoes and this has since sparked a large public outcry. Because of that, an Environmental Impact Assessment (EIA) has been commissioned but the findings are yet to be announced.

The study also conducted a survey of awareness on POPs through a questionnaire. The findings of the survey revealed that a good number, 63% of respondents have at least heard about POPs, mainly because of the Global Pesticides Project which targeted the same Sugar Industries. However, only 57% were able to give at least one example of POPs pesticides correctly. The worst is that even among those who have heard of POPs only 25% knew of the dangers or effects of their use to the environment. The study, therefore strongly recommends that efforts should be directed in raising awareness of the negative aspects of POPs' use to the environment if we are to succeed in their elimination given the current situation in which those advocating for the introduction of DDT are very busy playing down its long term side effects to the human health and the environment.

The study also found out that a reasonable number close to 400 workers are engaged in applying pesticides every day in the three plantations for control of problematic weeds. Manual mixing and application of pesticides are done near the flowing drains and permanent streams adjacent to the plot to be sprayed. They are doing so to avoid manual carrying of water hence, contaminating the edges of open drains. Spraying without leaving a buffer zone along streams results in pesticides ending up in water bodies like in the case of Kakira and Lugazi into the River Nile and Lake Victoria and for Kinyara River Kafu into Lake Albert. The contaminated water in turn can be "taken" by people and the animals hence affecting their health.

In Lugazi, however some drains and stream banks are currently being planted with *Vertiva* grass (*Vetiveria zizanioides*) as a measure to control erosion and also to act as buffer zone to pesticides sprays. Apart from the above, this densely tufted, wiry, glabrous, perennial grass, native in India and Ceylon has aromatic roots which can be cleaned and dried then used for making mats, fans, screens, awnings, pillows and sachet bags.

One new store with a Biobed for bio-degradation of pesticides spills was also constructed modeled on the Swedish design. Such Biobed would be useless if POPs are used since they cannot be biodegraded easily and persist in the environment.



Obsolete stocks may contain POPs - Source: Field Work research SCOUL Sugarcane Plantations, 2004

4. NEED FOR ALTERNATIVE POLICY

In Uganda, Pesticides Policy results in registration and control of pesticides and their related issues scattered between many uncoordinated Government Ministries. There is therefore a high need to bring it under a one-stop coordinated center. As at the moment the Ministry of Health is contemplating the introduction of DDT for control of malaria vector, the mosquitoes, under indoor residue spray despite the fact that the Crop Protection Division of the Ministry of Agriculture no longer registers any POPs chemicals for use in Uganda. NEMA is against DDT use without an EIA. This is because under current policy, use of DDT is restricted for health purposes for control of disease vectors such as the malaria-causing mosquito.

Secondly there is a need to develop alternative policies as our Government has acceded to the Stockholm Convention in order to ease its implementation under the National Implementation Plan (NIP).

Thirdly: There is a need to involve organized farmers' groups of large estates such as Uganda Sugarcane Technologist Association in the registration and control of Pesticides plus the National Union of Plantation and Agricultural Workers of Uganda since the use mainly affects the workers directly.

Lastly there is high need to harmonize our policy with our neighboring countries in order to combat the smuggling of chemicals along our common borders.

5. POLICY PROPOSAL

In brief the study is proposing that the new policy should among other things include the followings apart from highlighting what is already included in the Stockholm Convention:

1. *Pest outbreak monitoring and forecast mechanisms.* This will enable the country to clearly identify the particular pest, numbers that cause economic loss, seasonal and weather variability that favor or deter the pest build-up. In this case training of most personnel as a matter of policy should center on the life history of all common pests in order to adopt the best control mechanisms, keeping pesticides intervention at a minimum, in other words promote the policy should promote use of IPM and organic farming.

2. *Involvement of farmers groups and organizations* such as USCTA and the trade unions in the decisions to introduce or register new pesticides including the controversial ones like DDT or other POPs and toxic substances such as Paraquat.

3. *Harmonize pesticides policies within the East African Community* in order to combat illegal trade in Pesticides products and bring in more expertise for safe use of Pesticides products.

4. *Involving the Local Government Authority in the collection and disposal of empty containers and obsolete stocks of pesticides,* the importance of which should be emphasized.

5. *Emphasis should also be laid on training and certifications of all personnel involved in application and storage of pesticides* including stockists. The stockists are retail traders who deal in chemicals; some are licensed but many are not. Some of their scrupulous activities include repackaging chemicals in unlabeled containers, adulteration of chemicals and sell to unsuspecting customers.

6. *Routine inspection and certification of packaging labels and application equipment* by approved authority or institution. In Uganda most of the regulations are in place but there are few lowly paid inspectors to enforce them. A good policy could provide for the

involvement of individuals and groups to enforce the same and provision of necessary tools and funds.

7. To develop and include the National Standards of Minimum Residue Levels MRLs in the policy for foods and feed products.

8. Try and concentrate the issues of pesticides to a one-stop center: Another important aspect is the establishment of a one-stop center for registration; inspection and enforcement of pesticides regulation like for example NEMA. This should preferably be equipped with an analytical laboratory for testing toxicology, formulation and residues on foods and feed products.

9. The policy should be integrated into other sector policies such as education, health, gender, agriculture, and labor with emphasis on poverty reduction strategies.

10. The policy should also aim to meet the target set in the Johannesburg Plan of Implementation. It would create little impact if POPs issues were limited to the campaign ban only.

The use of DDT should be banned even for control of disease vectors like mosquitoes. Instead government can concentrate on the Roll Back Malaria programs and other sanitary measures and keeping pesticides intervention at a minimum.

11. Empowerment of customers of food products and other stakeholder groups.

In most African countries and Uganda in particular the markets (customers) are completely ignorant of the pesticides residues. Tomatoes are sold in Ugandan markets with residues of Dithane M 45 clearly seen on them even without the help of laboratory analysis. It is applied not only by farmers but also by market venders to preserve the tomatoes against rotting while in the markets. Raising awareness of customers is therefore a must to stop the practice.

Uganda has the opportunity to include this proposal when developing the NIP. However this would be impossible if the issue of pesticides in general and POPs in particular is left scattered in various Ministries without coordination.

6. CONSEQUENCES UNDER CURRENT AND ALTERNATIVE POLICIES

Currently the policy on pest control is not clear. On several occasions the country had pest outbreaks in some parts of the country causing destruction of crops that lead to mass economic loss and even famine in some areas. For example the outbreak of armyworms, caterpillars, coffee bores etc. This happens because there is no monitoring mechanism for pest forecast and pest outbreaks. The government has all along responded to such outbreaks only on an emergency and disaster basis. If farmers were trained in the pests monitoring and the use of control methods, it would reduce the problems and avoid the use of available scarce resources to combat the pest outbreaks. The farmers too would

know more about the pesticides they have to use, hence the understanding of the pesticides in their entire life cycles; that is from the transportation, storage, and use to the disposal stages. Nationally organized farmers and other civil society organizations must be supported and be engaged in government policy developing programs as key stakeholders in the Stockholm Convention Implementation Plan.

Uganda has not yet developed the NIP for the implementation of the Convention and without a new policy in place this may create difficulties in the actual implementation. The issue of pesticides management and POPs in particular is left scattered in various Ministries without coordination hence creating difficulties in the enforcement.

7. EXPERIENCE WITH PROPOSED POLICY IN OTHER COUNTRIES

1. Determination and inclusion of National standards of Minimum Residual Levels (MRLs). In the EU for example they have harmonized their MRLs making it easier to trace the levels of POPs in the products. This requires earlier control on their use since they would persist even on food samples.

2. Harmonize pesticides policies within the East African Community

There is need for cooperation between member states-say East African Countries like the EU (SCANAGRI) did i.e. taking necessary measures including legal measures to eliminate the illegal trade in pesticides products.

3. Routine inspection and certification of packaging labels and application equipment

Enforcement of the approved labels on the containers is very much lacking especially in Uganda and obsolete or POPs chemicals may still be sold in Uganda under different brand name. In Kenya for examples regular inspection and destruction or confiscation of pesticides products whose labels don't meet the national requirements. Kenya leads among the East African Countries in enforcing the sale of properly labeled products and control of illegal stocks by stockists.

4. Importance of involving the Local Government Authority in collection and disposal of empty containers and obsolete stocks of pesticides

In Sweden farmers' organizations are much involved in influencing policy on pesticides. The collections of empty containers are a direct responsibility of the Local Government Authority. Training and certification of workers involved in application is done before even allowing sale of chemical to that individual. Regular inspection of spray equipment is done on a routine basis.

5. Try and concentrate the issues of pesticides to a one stop-center

Tanzania is also contemplating establishing a one-stop center for pesticides registration and control at the Tropical Pesticides Research Institute (TPRI) situated at Arusha. They have also started regular inspection and licensing of spray equipment.

8. CONCLUSION AND RECOMMENDATIONS

8.1 Conclusion

This study on Non-POPs Strategies on Crop Protection has observed that extensive use of pesticides is not the best strategy for sustainable agriculture including the sugar cane growing, because of lack of capacity for sound management of pesticides. There is weak enforcement of the laws, lack of awareness among the workers and among the out growers including plantation management staff on management of pesticides through their life cycle. Uncoordinated policies, of different ministries and other government agencies such as Ministries of Health, Agriculture, Land and Environment and agencies like: Crop Protection Division, National Environmental Protection Authority (NEMA) etc makes it difficult to manage chemicals in a sound and sustainable way. There is need therefore to establish a one-stop center for policy coordination.

On the other hand, all employees regardless of their employment status should be provided with protective gear to protect them from pesticide hazards.

7.2 Recommendations

7.2.1 Recommendation on DDT and the Pesticides Law

Since the Uganda Government acceded to the Stockholm Convention on POPs, it is expected that other POPs will not enter the country, though the government is determined to go ahead with the DDT residual indoor spraying program for the control of malaria.

The study however recommends that:

- 1-The use of DDT be banned not only restricted. Government should concentrate on the on-going Roll-Back Malaria Program.
2. The government should apply the Rotterdam Convention; PIC provisions in order to control importation of unwanted chemical especially the POPs.
3. The Agricultural Chemical Statute, 1989 and Agricultural Chemical (Registration and Control) Regulations 1993 should be amended to bring farmers and workers organisation on board.

7.2.2 Recommendation for the Workplaces

To safeguard the workers and their families and the environment at large, we make the following recommendations to the three sugar plantations:

Safety and health training at the work place

Education and training of the workers is very important; this should include safe methods of work, avoidance of risks and the wearing of personal protective gear. Training course

for all levels of personnel is particularly valuable. They should aim at familiarizing the workers with safe working methods, safety rules.

We recommend that the three estates should embark on capacity building programs on sound management of chemicals.

Personal Protective Equipment (PPE)

Appropriate PPE should be provided to all those engaged in handling pesticides to protect them against exposures. Strict supervision and continuous information are necessary to ensure that personal protective equipment is worn and correctly maintained. Cleaning of the devices should not be done within rivers, streams and drains to avoid water pollution.

Establishing buffer zones

In order to reduce on the risk of contamination of surface water, there is need to establish clearly marked buffer zones for protecting the water. Avoid spraying close to open water streams and leave other vegetation covers near the drains or streams without spraying at least 6-30 meters.

Storage of Chemicals

Separate storage premises for agricultural chemicals should be provided with a Biobed for filling and parking spray equipment and to contain spillage. Agricultural chemicals are to be stored on wooden stands raised above the ground.

Treatment and medical examinations

Medical clinics should be equipped with Safety Data Sheets of all pesticides in use. This is important in event of emergency treatment and for regular check-up of employees. Medical examinations should be done on workers before and after their prescribed period of spraying

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ANNEXES

Annex 1 Summary of the survey of awareness on POPs in the sugarcane industries

DETAILS	OCCUPATION						TOTAL	% TOTAL
	Administrator	Worker	Local Authority	Health Worker	Plant Protector	Other		
Number of Respondents	15	11	-	1	-	3	30	
Defined pesticides properly	7	1	-	1	-	2	11	37%
Did not define properly	8	10	-	-	-	1	19	63%
Have heard about POPs	10	5	-	1	-	3	19	63%
Have never heard of POPs	5	6	-	-	-	-	11	37%
Could name some POPs	9	5	-	1	-	2	17	57%
Knew some dangers of POPs	7	4	-	1	-	2	14	47%

Annex 2 List of current pesticides being used in and around the 3 sugar companies

User	Common name	Chemical name	Target organism	Crop	Mode action	Remarks
Sugar Industries	R-P Diuron Flo	Diuron	Grasses and Broadleaf	Sugarcane	Post emergence to cane	
		Actril D-S				Not in use
	Roundup	Glyphosate	Grasses	Sugarcane	Pre-emergence to cane	
	Amitryne	Ametryn	Broadleaf and Grasses	Sugarcane	Post emergence to cane	
	Asulum					Not in use

		2-4-D	Broad leaves	Sugarcane	Post emergence	
	Regent 3G	Fipronil 3g/kg	Termites	Sugarcane, Forestry	Bait	
Flower Companies	Nuxal				Growth Regulator	
	Kumulux	Micronised Sulphur	Powdery Mildew	Flowers		
	Apollo	Clofentezine	Red Mite	Flowers		
	Abamectin	Abamectine	Red Mite	Flowers		
	Benlate	Benomyl	Fungus Mold	Flowers		
	Brigade	Bifenthrin	Aphids	Flowers		
	Bellkute	Iminoctadine Tris	Powdery Mildew	Flowers		
	Meltatox	Dodemarph acetate	Powdery Mildew	Flowers		
	Mawiozob		Powdery Mildew	Flowers		
	Milraz	Cymoxanil +Propineb	Fungus	Flowers		
	Nissorun	Hexythiazox	Red Mite	Flowers		
	Nimrod	Bupirimate	Powdery Mildew	Flowers		
	Keshet	Deltamethrin	Aphids	Flowers		
	Peropal	Azocyclotin	Red Mite	Flowers		
	Polytrin P466	Cypermethrin	Red Mite	Flowers		
	Pride	Fenarimol	Red Mites.	Flowers		
	Rubigan	Fenarimol	Powdery Mildew	Flowers		
	Stroby	Kresoxim-Methyl	Powdery Mildew	Flowers		
	Saprol	Tritorine	Powdery Mildew	Flowers		
		Dyacimic				
	Thionex					
	Moeltistox					
Forestry	Contra-z	Chlorpyrifos 500g/l Cypermethrin 50g/l	Insects	Forestry	Contact	
	Agro-pyrofos 45EC	Chlorpyrifos 480g/l				
	Agro-Lambda 2,5EC	Lambda-Cyhalothrin				
	Rokett					

	Fungaran	Copper and Manganese	Fungus			
	Kocide	Ferrous salts	Fungus	Forestry	Systemic	
	Timbercare	Pentachloromethane				
	TCMB	Thiocyanomethionate Benzenomethionate				
	Celcure	Copper oxide, Arsenic pentoxide, Chromium trioxide				
	Dimethoate Rogoor		Gold midge flies	Forestry	Systemic	
	Ridomil		Fungus	Forestry	Systemic	
Out growers	Furradan FURACAR B 5G	Carbofuran 5% Granules (Encapsulated)	Insecticide, Nematicide	Wheat, Rice, Tobacco Cotton, Barley	Systemic	
	Ambush		Insecticide			
	Dithane M45		Fungicide	Tomatoes		

Annex 3 Photographs



Photo 1 Burnt vegetation around a stream as a result of application of pesticides

Photo 2 Below is a Local Government Official opening a newly constructed Pesticides store in SCOUL Section. The store is designed with Biobed facilities for biodegradation of pesticides spills. However this technology cannot work if POPs are used



Photo 3 Cane burning