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منظمة الأغذية والزراعة للأمم المتحدة | 联合国粮食及农业组织 | Food and Agriculture Organization of the United Nations | Organisation des Nations Unies pour l'alimentation et l'agriculture | Organización de las Naciones Unidas para la Agricultura y la Alimentación

DESERT LOCUST CONTROL COMMITTEE

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REVIEW OF HUMAN HEALTH AND ENVIRONMENTAL ISSUES
(Agenda Item 6d)

The use of pesticides in Desert Locust control may lead to risks for human health and the environment. These risks concern the type of pesticides used, the way they are packaged/labelled and stored, the handling, and the application against the target. Guidelines accepted by the FAO Conference on pesticide management are found in the *International Code of Conduct for the Distribution and Use of Pesticides*.

Selection of pesticides

Recommendations on pesticides for Desert Locust control are made by the independent, international FAO Pesticide Referee Group (PRG), which recommends a number of active ingredients based on proven efficacy under field conditions and on the acceptability of the health and environmental risk of their use. The 9th report of the PRG is submitted to the DLCC for adoption.

During the last campaign, pesticides purchased by FAO were those recommended by PRG. Not all bilateral donors or affected countries followed the PRG recommendations.

Products should be in confomity with strict standards concerning composition, labelling and package, and they should/must be inspected before delivery. Only products that are registered in the country for the intended use should be purchased, unless the national registration authorities in recipient countries waive this obligation. It is not clear whether these policies have been followed by all partners.

During the 2003-05 Desert Locust campaign there were difference of opinion on the handling of pesticides by farmers. Given the high toxicity of pesticides in ULV formulations, FAO did not support their delivery to farmers.

The Committee may wish to:

- *recommend that all parties follow the recommendations of PRG for the selection of pesticides;*
- *promote the registration of pesticides for Desert Locust control;*

- *recommend that all parties ensure that national regulatory requirements are met when providing pesticides;*
- *recommend that all parties ensure that pesticides are properly labelled in the language of the country and that the quality is appropriate; and*
- *consider whether farmers should handle ULV pesticides for locust control and, if so, under which conditions.*

Storage, stocks

Lack of coordination among partners on the provision and purchase of pesticides during the recent campaign gave rise to an important over-supply. These pesticides have to be stored under conditions that meet international standards. An FAO officer dedicated to this task advises governments on storage. New stores are being constructed and old ones rehabilitated or destroyed, this in close collaboration with the World Bank. A regional workshop jointly organized by FAO and the World Bank took place in May 2006, in Bamako (Mali) to develop the coordinated management of the considerable pesticide stocks remaining after the 2003-2005 campaign, and to avoid their becoming obsolete. The report of the meeting is presented in a separate document. The main conclusions of the meeting concerning stocks are the following:

- the best possible use of the pesticide stocks would be against grasshoppers during the forthcoming summer campaigns, subject to their registration for this use and spray operations executed by authorized, well-trained staff;
- the storage and management capacity is insufficient, leading to misuse of the pesticides;
- a regional database on pesticide stocks should be established and concerned staff trained in pesticide management;
- the list of pesticides registered for locust control should be increased;
- quality analysis of the stored pesticides should be carried out in a systematic manner.

The Committee may wish to:

- *endorse the conclusions of the workshop concerning pesticide stocks and storage of stocks.*

Disposal of empty pesticide containers

As a result of the campaign vast amounts of empty pesticide containers are awaiting destruction. Metal drums need to be crushed in machines that combine rinsing with special solvents and the crushing. Drumcrushers have been delivered to Mauritania and Mali, and the same equipment has been ordered for Algeria, Chad, Morocco, Niger, Senegal and Tunisia. The machines are capable of reducing 200 litre steel barrels to 20 kg packages, the size of a small suitcase. These can be recycled in steel smelters. The disposal of plastic containers, which is more complicated because some pesticide is absorbed into the plastic, needs further research. Because of this complication, FAO has decided only to order pesticides in metal drums. Moreover, in future orders for pesticides the removal of the containers could be included.

The Committee may wish to:

- *recommend that plastic containers not be used for locust pesticides;*
- *recommend that FAO discuss with pesticide companies terms for contractual arrangements that include removal of containers.*

Development of alternatives

Most human health and environmental risks could be avoided through the use of products that are virtually non-toxic for non-targets, such as Green Muscle®, the active ingredient of which is the entomopathogen fungus *Metarhizium anisopliae* var. *acridum.* This product has recently been tested in large-scale field trials in Algeria and in Niger, with satisfactory results. Other options, such as phenyl-aceto-nitrile (PAN), which alters the behaviour of the locusts and also enhances the effect of pesticides and Green Muscle®, have not yet been sufficiently tested under operational

conditions. Trials are scheduled for 2006 and 2007. Little is known of the ecological risks related to the use of PAN. Environmental data on the product are a prerequisite for registration and for evaluation by the Pesticides Referee Group. In 2006 and 2007, toxicological and environmental trials will be carried out to provide these data. Non-target side effects of Green Muscle® concern essentially the non- target orthopterans whose populations, if affected, tend to recover within the same season.

The old practice of barrier spraying, which was the main application method used in the 1980s and employed the organochlorine dieldrin - since banned - in which only about 10% of the infested area is treated, is refined and adapted for currently available relatively persistent pesticides. These include Insect Growth Regulators and fipronil. Operational trials are foreseen with the emphasis on determining environmental side-effects that may result from the relative persistence of the products. All field trials are hampered by the lack of suitable target populations. Therefore, efficacy trials will also be executed in confined areas, using reared locusts. Training of field staff is also foreseen, as well as awareness-raising among decision makers, with respect to these alternatives to conventional organophosphate pesticides.

Alternatives to conventional methods have to be incorporated into control strategies. This requires that the speed of action of biological products be enhanced and that their stability, while kept and transported under field conditions, be improved. FAO is working, in collaboration with ICIPE and IITA, on the further development of biological products that better correspond with the characteristics needed for use in preventive control strategies.

In February 2007, in collaboration with the World Bank, a workshop will be held at Noukachott (Mauritania) on the issue of the perspectives of biopesticides in Desert Locust control. The objective is a work plan for the further development and the promotion of alternative methods, to be presented to Governments for implementation with the assistance from FAO and the World Bank.

The Committee may wish to:

- *call on donors to support the development of alternatives to chemical pesticides;*
- *call on locust-affected countries to cooperate fully with ICIPE, IITA, FAO and other relevant agencies and institutes in testing these compounds;*
- *request the FAO Secretariat to provide a full report on the outcomes of these trials at the next session of the Committee.*

Good practices in the application of pesticides

The *FAO Desert Locust Control Guidelines* include the correct application of pesticides against Desert Locust[1]. The Good Practices described in the Guidelines aim to avoid the risk of contaminating workers handling pesticides, eliminate danger to rural populations and minimize side-effects on the environment. Volume 6 of the Guidelines concerns the safety procedures to be taken by any person directly involved in pesticide applications, as well as the measures to avoid contamination of non-target ecosystems and organisms. During the campaign, a few cases of effects on domestic animals were suspected to have occurred, however, research on the site indicated that there was no contamination. No other serious human or animal health incidents have been reported. Some spray operators who showed the first indication of poisoning had to be temporarily withdrawn from spray operations. There is, however, a lack of analytical methods to monitor intoxications other than those caused by organophosphates and carbamates. Research has started to develop biomarkers for the detection of exposure to pyrethoids.

The Committee may wish to:

- *call on all parties to fully implement good practices as described in the Guidelines;*

[1] Desert Locust Control Guidelines; 7 volumes. FAO, Rome, 2001 (available at www.fao.org/ag/locusts)

- *request FAO to continue, with the assistance of donor and within resources, the development of biomarkers.*

Monitoring of control operations

The proper implementation of Good Practices for Desert Locust control requires training, appropriate equipment and monitoring of control activities in the field. The training of operators has been reported elsewhere in this meeting. Monitoring of the applications is the task of Quality and Environment Surveys of Treatments (QUEST) teams who, during the campaign, have been specifically trained to check the technical quality of applications (e.g. spraying at the correct dosage, correct targeting, etc.), safe handling of the pesticides and to check the exposure of operators and others through measurement of blood cholinesterase (ChE) inhibition, which is an early indicator that a person has been contaminated. The teams also report on observations of environmental side-effects, if any, and, when deemed necessary, collect samples of soil and vegetation for residue analysis. QUEST teams have so far been established in Burkina Faso, Cape Verde, Chad, Mauritania, Mali, Niger, the Gambia, Guinea, Guinea Bissau and Senegal. The teams are composed of staff from three ministries (Agriculture, Health and Environment). In a few countries, such as Mauritania, Mali and Senegal, the institutionalization of the teams has been achieved or is in progress. In other countries no significants steps toward institutionalization have yet been made. It has to be determined to what extent the QUEST approach is sustainable and if it should be introduced in other countries.

The Committee may wish to:

- *call on members to institutionalize QUEST teams through assigning QUEST team members from the different ministries, ensuring replacement of members whenever required and ensuring training of QUEST team members;*
- *consider the extension of the QUEST approach to other regions.*

Improvement of the selectivity of application techniques

Lack of appropriate instruments that allow spray swathes to be spaced correctly and avoid non-target zones (such as water bodies) during aerial treatment may have resulted in pesticide wastage and has been the cause of a few environmental incidents. The use of Differential GPS (DGPS) Track Guidance Systems in spray aircraft, which is now required by FAO in all aerial spraying contracts, helps to eliminate these problems. Recently, equipment for track guidance has also been developed by FAO for ground applications by vehicle-mounted sprayers. The first results are promising and it is foreseen that the system should be widely tested before general introduction.

The Committee may wish to:

- *request all parties to ensure that spray planes/aircraft are equipped with the appropriate instruments to ensure precision spraying.*

Information and awareness raising

A brochure entitled *Fighting the Locusts….Safely: Pesticides in Desert Locust control – Balancing risks against benefits* has been produced in English, Arabic and French, and distributed widely to locust-affected countries, donors, and other interested parties. A series of posters and handouts on the risks of locust pesticides is ready to be field tested among the general public, especially the inhabitants of areas where treatment actions take place or where pesticides are stored. A workshop will be organized to further raise awareness concerning the hazard of conventional pesticides and to inform participants about the advantages, and limitations, of the use of alternative methods. Recently, an exhibit in the atrium at FAO Headquarters has been updated to include information on current activities addressing environmental concerns of locust control.

Field studies

A number of field studies aimed at monitoring side-effects of control operations were carried out in the early stages of the upsurge. Although each of the studies indicated that the use of conventional pesticides represents an environmental risk (numerous non-targets insects/arthropods killed; workers who had to be taken off work with pesticides for a few days, to recover from pesticide contamination), no serious incidents have been observed or witnessed. Other ongoing research is aimed at: refining the barrier technique; analysing the socio-economic benefit of using non-conventional pesticides; identifying geographical zones that are specifically sensitive to certain pesticides; and the development of more human biomarkers for the exposure to pesticides in addition to those already used (ChE analysis) for organophosphates. Funding is available to make a good start in each of the subjects.

Pesticide bank

Many proposals have been made in the past on pesticide banks. The objective of a pesticide bank is to make pesticides available at short notice in locust emergency situations. The simplest way to ensure such availability may be long-term standby contractual arrangements with suppliers of pesticides.

The Committee may wish to:

- *recommend that FAO explore the possibilities of contractual arrangements with manufacturers of pesticides, in order to have the products available in an emergency situation, in appropriate time and quantity, and at the place needed.*