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DESERT LOCUST CONTROL COMMITTEE

42nd Session

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Report on the 11th meeting of the Locust Pesticide Referee Group (LPRG)

Agenda item 10

Background

The Locust Pesticide Referee Group (LPRG) is an independent body of experts that advises the Food and Agriculture Organization of the United Nations (FAO) on the efficacy as well as health and environmental risks of insecticides used in locust control. The LPRG reviews insecticide efficacy trial reports and establishes recommended dose rates against the Desert Locust and other species of locusts; evaluates environmental impact studies and classifies insecticides with recommended rates as to their environmental and health risks; reviews operational use of insecticides in locust control and possible constraints; and identifies gaps in knowledge and recommends further studies to be conducted.

The LPRG advises on other matters pertaining to locust control as requested by FAO.

The resulting advice systematically lists insecticides suitable for locust control from the scientific point of view.

Because of restrictions imposed on account of the COVID-19 pandemic, the 11th meeting took place in several virtual sessions between February and November 2021. The full report of the meeting is available at the following link: <http://www.fao.org/3/cb7897en/cb7897en.pdf>.

In preparing for the LPRG meeting, major pesticide manufacturing and formulating companies (29 in total) as well as national locust control organizations, plant protection services and research institutions in locust-affected countries (69 in total) had been approached by FAO in July 2020 to obtain new field efficacy trials and environmental impact studies of insecticides for locust control.

Main discussion and outcomes of the meeting

General remarks

- In total, 15 reports on biological efficacy, some of them just summary tables or statements, were made available to the LPRG for review. Of these, only 6 studies were done under field or semi-field conditions;
- The LPRG noted a lack of efficacy studies submitted by the pesticide industry, particularly of new potential insecticides for locust control;

- The quality criteria for field trials on the efficacy of insecticides against the Desert Locust and other locusts and grasshoppers are rarely met;
- The LPRG removed bendiocarb (carbamate insecticide), from the list of its recommended insecticides for control of the desert locust, based on environmental and human health concerns. This follows the phase-out of all bendiocarb products by the manufacturer;
- ULV formulations of organophosphates and pyrethroids continue to be the mainstay of control. Some countries such as Somalia also use insect growth regulators and biopesticides (*Metarhizium acridum*) at a large scale.

Human Health Risks

The LPRG classifies human health hazards of insecticide formulations recommended against Desert Locust according to the World Health Organization (WHO) classification (WHO 2020) and the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

All insecticides with a verified dose rate against the Desert Locust were re-evaluated against the updated criteria.

The LPRG acknowledged that *chlorpyrifos* remains an attractive compound for Desert Locust control due to its speed of action and lack of recovery after initial knock down. The product is relatively inexpensive and easy to purchase. However, there is increasing political and regulatory opposition to the molecule, drawing public criticism due to its human health risk. Registration in the EU was not renewed in January 2021. Therefore, European partners are likely to end further use as was the case in USA.

Environmental Evaluation

In accordance with international guidelines on the use of pesticides and toxic chemicals, the LPRG emphasized the need for risk reduction in the selection and use of pesticides for locust control. The LPRG noted that FAO is putting in place procedures for Environmental Impact Assessment (EIA) of projects and activities under its management. The development of regional Environmental, Health and Safety (EHS) Guidelines and Manuals (2021) is also welcomed.

A total of 35 environmental field studies were reviewed during this session. The LPRG noted the relatively large fraction of environmental studies that did not meet the minimum quality criteria.

For ecological reasons, as well as from an economical point of view, barrier treatments are preferred over blanket treatments. At least half of the inter-barrier areas need to be completely uncontaminated by the insecticide if they are to function as true *refugia*. Unfortunately, only few reports were submitted on the environmental impact of barrier treatments.

Insecticide selection

The LPRG noted that locust control campaigns continue to rely heavily on organophosphate insecticides, presumably because these are readily available and at low cost.

In view of increasing concerns about the use of synthetic insecticides and the absence of new products evaluated for locust control, the LPRG considers that emphasis should be given to the least toxic compounds already evaluated in relation to human health and environmental impact,

provided they are effective against the locust target to be controlled. To give more guidance to locust-affected countries, following insecticides with verified dose rates against the Desert Locust are presented as a priority list:

Priority 1: *Metarhizium acridum* (mycoinsecticide)

Priority 2: Insect Growth Regulators- IGRs (*Diflubenzuron, Teflubenuron, Triflumuron*)

Priority 3: The neurotoxic insecticides (last resort)

A: Phenyl pyrazoles (*Fipronil*)

B: Pyrethroids (*deltamethrin, lambda-cyhalothrin*)

C: Organophosphates (*Malathion, Fenitrothion, Chlorpyrifos*)

Insecticide formulation quality and packaging

Since the nature of solvents may cause corrosion problems on pesticide spray equipment, as reported during aerial locust control operations in response to the recent upsurge in the Horn of Africa, the LPRG recommends that in the procurement of UL formulations suppliers should indicate all solvents in the formulation and certify that these do not damage the spray equipment.

The LPRG also stressed the need that when purchasing insecticides, the metal drums must comply with quality specifications, in compliance with international standards, to prevent breakage, insecticide loss and environmental contamination.

Waiting period

The LPRG discussed the lack of information on withholding periods, re-entry intervals and pre-harvest intervals for insecticides used in locust control. It requested that a review be conducted by FAO of available data on the basis of its experience in pesticide residue evaluation, in order to make suggestions on provisional waiting periods.

Training

The LPRG underlined the continued importance of training and capacity building of staff to ensure that locust management is effective and does not pose undue risks to human health and the environment.

Evaluation and monitoring

The LPRG noted that too few reports on operational monitoring of locust control are being submitted, particularly for newer products such as *Metarhizium* which has been used for the first time at operational scale during the 2020-21 Desert Locust outbreak.

The LPRG stressed the importance of appointing qualified teams whose task will be to monitor the effectiveness of the control operations.

Towards preventive locust control

It emerged from the discussions that advances in early warning, survey and control operations, combined with the use biopesticides and IGRs, constitute the basis for preventive measures and an alternative to conventional insecticides for locust control.

The 11th LPRG came up with 21 recommendations for the attention of the FAO, Regional Commissions, Countries and partners (annex 1).

Points for discussion and decisions

- *DLCC is invited to note the outcomes of the LPRG 11th and provide any further relevant guidance.*

Annex 1

Recommendations

- I. In view of a dearth of efficacy studies submitted by pesticide industry, in particular of new and low risk insecticides holding potential for locust control, the LPRG recommended that FAO continues to engage with pesticide industry and initiate a dialogue on how best to test and further develop such insecticides for locust control.
- II. The LPRG recommended that FAO puts a mechanism into place for the maintenance, updating and accessibility of the FAO Insecticide Trials Database, which contains all efficacy trials submitted to the LPRG since its first meeting but has not been updated since 2014.
- III. FAO should continue to actively disseminate the various guidelines for efficacy testing of insecticides for locust and grasshopper control.
- IV. FAO should continue to encourage plant protection organizations, manufacturers, and any other institutions to submit efficacy data on new or existing products for review.
- V. Given operational as well as environmental and human health interests, the LPRG recommended that further efficacy trials with *spinosad* and binary insecticides be conducted. Likewise, laboratory-tested new insecticides such as *anthranilic diamides* should also be tested under field conditions.
- VI. The LPRG pointed out that better surveillance of locusts allows earlier and more targeted preventive control with less harmful products.
- VII. The LPRG recommended that spray teams applying biopesticides are specially trained and supervised to ensure optimal efficacy. Furthermore, the Horn of Africa campaign should be taken as a learning case for biocontrol and subjected to a thorough analysis of success factors and impediments.
- VIII. To ensure correct application and precise recording of aerial control operations, the LPRG recommended that all aircraft involved in locust control are equipped with a (D) GPS-based track guiding and logging system as well as an on-board flow meter. Likewise, GPS spray tracking devices should also be used in ground treatments.
- IX. The LPRG further recommended wider use of EarthRanger or similar systems aggregating eLocust3 and other Desert Locust monitoring data to derive historical and current locations of locust populations as a basis for improved monitoring, control and impact assessment. It also recommended that such systems be used when undertaking aerial control to improve fleet management, daily deployment, control operations and reporting.
- X. The LPRG recommended that the potential for drones both to survey and to control locusts be further investigated.
- XI. The LPRG stipulated that EHS Standards must be followed and monitored by specialist staff operating independently of application teams.
- XII. In view of low quality of many environmental impact studies, the LPRG proposed that FAO elaborates guidance for experimental environmental field studies in locust control.
- XIII. The LPRG recommended that FAO updates the Desert Locust Guidelines – Safety and Environmental Precautions, taking account of the Practical Guidelines on Pesticide Risk Reduction for Locust Control in Caucasus and Central Asia (FAO, 2019).

- XIV. For countries to have access to low-risk insecticides, the LPRG recommended that countries are encouraged to speed up registration of IGRs and *Metarhizium*.
- i. The LPRG stressed that countries are responsible for preventing the creation of obsolete pesticide stocks and for disposing of those stocks when they are created. It further emphasized that donors should comply with good practice such as the OECD DAC Guidelines on Pest and Pesticide Management, and recipient countries should be in a position to refuse unsolicited donations of pesticides, or donations of inappropriate pesticides.
- XV. The LPRG emphasized that future provision of pesticides for locust control should:
- i. Ensure supply mechanisms designed to prevent overstocking and obsolescence;
 - ii. Use improved stock and quality control systems to reduce obsolescence;
 - iii. Relocate unused stocks to other locust-affected countries if possible (triangulation);
 - iv. Ensure coordination among donors to prevent inappropriate or excess supplies;
 - v. Be based on needs assessments using quality forecasting data (e.g. from the Emergency Prevention System (EMPRES) for Transboundary Animal and Plant Pests and Diseases).
- XVI. The LPRG reminded that JMPS specifications (FAO/WHO Joint Meeting on Pesticide Specifications) should be available for all chemical insecticides listed for locust control.
- XVII. The LPRG recommended that in the procurement of UL formulations of insecticides suppliers should indicate all solvents in the formulation and certify that these do not damage spray equipment. Furthermore, the LPRG upheld its previous recommendation that a dialogue be organized or facilitated between spray equipment manufacturers and pesticide manufacturers to identify solvents that must be avoided in UL formulations for locust control.
- XVIII. With the aim to propose provisional withholding periods, re-entry intervals and pre-harvest intervals for the insecticides used in locust control, the LPRG reiterated its previous recommendation that FAO should conduct a review of available data on such waiting periods, including data that may be extrapolated to locust control insecticide formulations and use conditions.
- XIX. In view of the great importance of training and capacity building of staff to ensure that locust control is effective and does not pose undue risks to human health and the environment, the LPRG recommended that countries and FAO maintain their emphasis on, and where possible further strengthen, training in good locust control practices. This also includes the need to raise awareness amongst communities in areas where locust control is taking place.
- XX. The LPRG reiterated its previous recommendation that control organizations conduct operational monitoring of the efficacy of locust control and report the results to FAO for verification of recommended dose rates, using eLocust3 or other GPS technologies for GIS mapping and analysis.