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USAID Pesticide Procedures

**Workshops on Environmental Management
of Socioeconomic Development Programs in
Post-Conflict Sierra Leone**

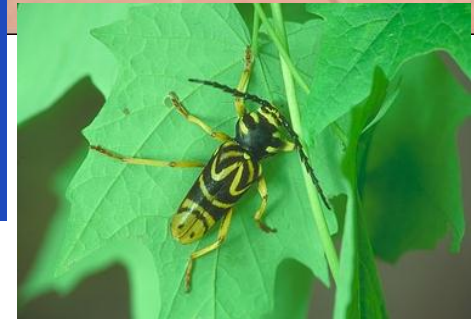
March 2009

Defining pests and pesticides



A pest is...

an organism that reduces the availability, quality, or value of some human resource (i.e., food or health)



A pesticide is...

any chemical or biological agent that kills or diminishes the action of plant or animal pests



Defining pesticide use:



At USAID, “pesticide use” is broadly interpreted:

- **Procurement, transportation, storage, mixing, loading, application, and disposal**
- **Technical assistance in pesticides application**

So is “pesticide supply:”

- **Not only direct purchases but also...**
- **Special payments, donations, free samples, and other forms of subsidies**
- **Credit provisions to beneficiaries - or a guarantee of this credit to banks or other credit providers – for pesticides purchase**

USAID Pesticide Policy

In general...



USAID considers pesticides as a
“last resort”

Alternatives to chemical pesticide use should be implemented whenever possible, such as:

Integrated Pest Management (IPM):

- **Biological controls**
- **Traps**
- **Better cultural practices (crop rotation and proper soil management)**

What is Integrated Pest Management (IPM)?

- Integrated Pest Management (IPM) relies upon comprehensive and current information about the interaction of pests with their environment to implement common-sense practices in combination with available pest control methods.
- USEPA
- IPM attempts to control pests in an economically and environmentally rational manner; it emphasizes non-chemical tactics which cause minimal disruption to the ecosystem.

- USAID



USAID Regulation 216 Pesticides Procedures



All proposed projects involving assistance for the procurement or use (or both) of pesticides must complete an Initial Environmental Examination (IEE) as well as a Pesticide Evaluation Report and Safer Use Action Plan (PERSUAP).

The “PER” in PERSUAP

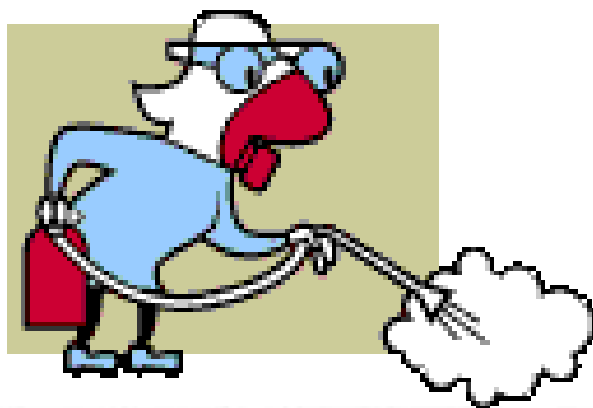
The pesticide evaluation report should consider at minimum the following 12 factors:

- USEPA and host country registration status of the requested pesticide
- The basis for selection, including
- The extent to which the proposed pesticide use is compatible with an IPM program



- Active ingredient
- Efficacy, price, availability, safety
- Formulation
- Packaging

The “PER” in PERSUAP



- The proposed method of application, including availability and appropriate safety equipment
- Any acute and long-term toxicological hazards, either human or environmental, and measures available to minimize such hazards

VII. Crop-Specific Information

CORN Tank Mixes

Laddok S-12 + Atrazine

Laddok S-12: 1.33-2.33 pints per acre

Atrazine: 0.75-1.00 pound per acre

Oil Concentrate: 1 pint per acre

Adding atrazine will provide residual weed control and suppress giant, green, and yellow foxtail. Atrazine products compatible with Laddok S-12 include A.Atrax® 4L and A.Atrax® Nine-0 herbicides as well as other similar generic formulations containing atrazine.

Tank Mix Rates for Laddok S-12 + Atrazine

Laddok S-12	Atrazine ¹
1.33 pints per acre	1 pound per acre
1.67 pints per acre	1 pound per acre
2.33 pints per acre	0.75 pound per acre

¹ See Section VI, General Restrictions and Limitations for maximum amounts of atrazine allowable per season.

Consult your local agricultural extension specialist for information on sweet corn varieties that are tolerant to this tank mix.

Laddok S-12 + Banvel
Laddok S-12: 1.33-2.33 pints per acre
Banvel: up to 16 fl oz per acre
UAN Sol or AMS

For use on field corn only for improved control of biennial weeds, corn (redroot and smooth), rice (common and tall), and wild rice.

Tank Mix Specific Restrictions

- Do not add other additives
- Follow the application procedure for sensitive crops.
- Do not apply this tank mix

Laddok S-12 + Bladex® 90 DF

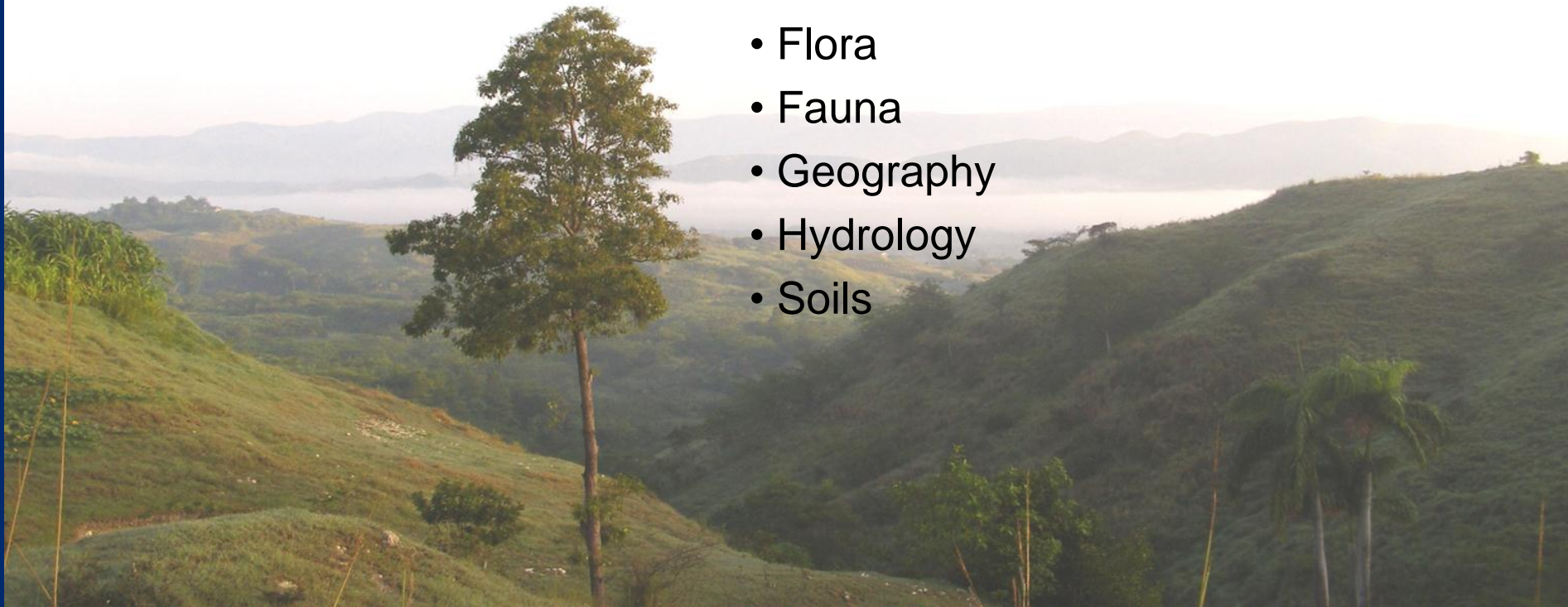
Laddok S-12: 1.33-2.33 pints per acre

Bladex: 1.67 pounds per acre

For use on field and silage corn only to control major troublesome broadleaf weeds and small annual grasses and to reduce the potential triazine carryover into rotational crops. Annual grasses controlled by a Laddok S-12 + Bladex 90 DF tank mix include: crabgrass, fall panicum, giant foxtail, goosegrass, green foxtail, stinkgrass (Indian lovegrass), witchgrass, and yellow foxtail. Refer to Table 1 for rate and timing for

The “PER” in PERSUAP

- The effectiveness of the requested pesticide for the proposed use
- Compatibility with target and non-target ecosystems
- The environmental conditions under which the pesticide is to be used:
 - Climate
 - Flora
 - Fauna
 - Geography
 - Hydrology
 - Soils



The “PER” in PERSUAP

- The availability and effectiveness of other pesticides or non-chemical control methods
- Host country’s ability to regulate or control the distribution, storage, use and disposal of the requested pesticide
- Provisions for training of users and applicators
- Provisions for monitoring the use and effectiveness of the pesticide

The “SUAP” in PERSUAP

A pesticides Safer Use Action Plan (SUAP) should at minimum:

- Link with national pesticide registration and pest management programs and ensure formal national registration of pesticides:

- Quality standards and control procedures
- Enforcement
- Good packaging and clear labeling!

- Define and assure safe use practices, such as:

- Selecting the least toxic formulation
- Considering alternatives
- Continued research on new pest control methods and effectiveness under local conditions

The “SUAP” in PERSUAP

A pesticides Safer Use Action Plan (SUAP) should:

- Assure accessibility of protective clothing and equipment
- Provide training on handling, use, storage, and disposal

AT ALL LEVELS

- Integrate mitigation measures
 - USEPA-recommended pesticides
 - Avoid disposal where bodies of water could be contaminated
 - Provisions for spill prevention and clean-up



- Translation into local languages and use picture cues
- Training at the household/village level
- Provisions for proper collection and disposal of containers



EXAMPLE: A PERSUAP for maize in Kenya

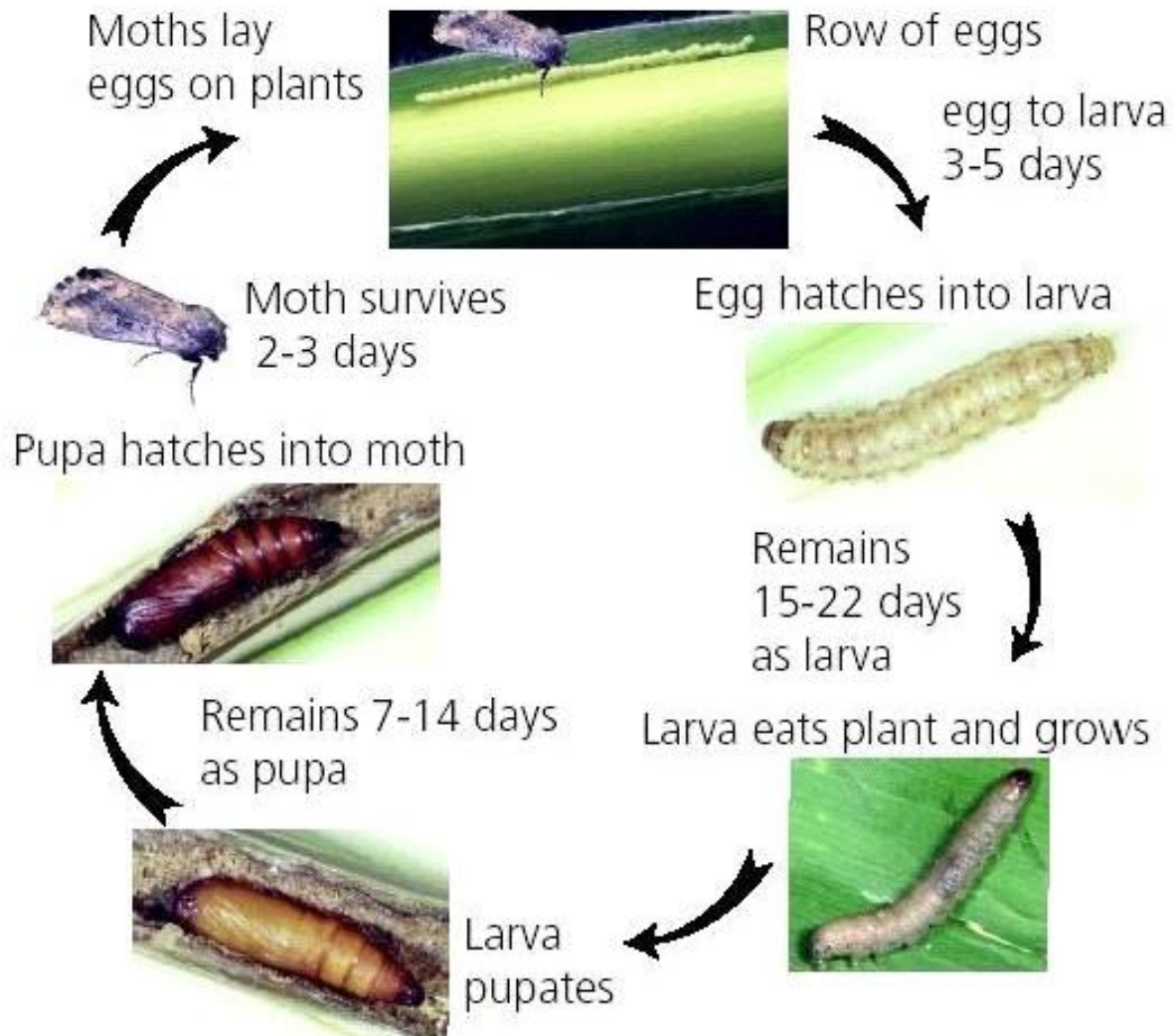
- Primary pest = maize stalk borer (African stem borer - *Busseola fusca*)
 - Indigenous African moth whose larvae bore into grasses with thick stems.
 - Can severely reduce maize production



Problematic agricultural practices

- **Extensive maize monocropping and intercropping – maize pests are ensured survival (up to 65% of plants are attacked in some areas)**
- **Small-holders must intensively exploit their lands to produce for household (average 1.5 ha) but constantly face low yields**
- **Protective clothing not worn**
- **Sprayer equipment in poor condition; lack of knowledge on dosing, nozzle adjustment, calibration, etc.**

Pest Biology: important to understand at what stage(s) and how to combat!



IPM OPTIONS

- **Good agricultural practices reduce infestation:**
 - Crop rotation
 - Soil fertilization for healthy, resistant plants
- **Natural enemies: parasitic wasps attack larval and pupae life stages** (*Platytelenomus busseolae*) – can bring down pest population sizes but **not enough**
- **Resistant maize:** research on resistant varieties being conducted
- **WHEN NECESSARY:** If more than 5 out of every 100 randomly selected plants is effective, use a low-risk insecticide

INSECTICIDE OPTIONS

- Liquid formulations: **high-risk** due to lack of use of protective clothing, and poor condition of sprayers
- Powder formulations: **high-risk** due to drift, inhalation
- Granular formulation: **lower-risk** - can be applied manually with no direct contact



Selection: Bulldock GR (0.5 g beta-cyfluthrin/kg)

Pesticides Evaluation Report for “Bulldock” insecticide

1. USEPA and Kenya Registration Status – IS currently registered for both.

- Sources: Ministry of Agriculture, Ministry of Environment, www.epa.gov, www.panna.org

2. Basis for selection

- Effective - usually only one application per season needed = 20g beta-cyfluthrin/ha
- Pest-specific – unlikely to harm non-target, beneficial insects
- Lower-risk application method: “salt-shaker” container prevents direct contact
- Lower relative toxicity to humans, environment compared to liquid/powder formulations

Pesticides Evaluation Report for “Bulldock” insecticide

3. The extent to which the proposed pesticide is compatible with an integrated pest management system:

- Applied as a preventative treatment on parts of plant where the larvae will come in contact.
- Unlikely to affect natural predators of the stalk borer.
- Genetically resistant varieties and introduction of natural predators are currently being investigated.
- Good ag practices:
 - Crop rotation, early planting and fertilization.
 - Infected stalks should be collected and burned or buried deep within the soil to prevent moth emergence.

Pesticides Evaluation Report for “Bulldock” insecticide

- 4. Proposed method(s) of application, availability of equipment and safety of equipment**
 - “Salt-shaker” container allows application without direct contact.
- 5. Potential acute or long-term human or environmental hazards and measures to reduce any hazards**
 - The formulation and the dosage rate being applied is very unlikely to have significant any effects on humans, birds, fish or bees. Not persistent or highly mobile in soils.
- 6. Effectiveness of the pesticide for the proposed use:**
 - Evaluated by KARI in Kenya and widely used throughout Africa for this purpose.

Pesticides Evaluation Report for “Bulldock” insecticide

7. Compatibility with target and non-target ecosystems

- Low concentration, granular formulation, plant-specific application and rapid degradation make any adverse ecosystemic effects unlikely

8. Conditions for use of the pesticide (climate, flora, fauna, geography, hydrology, soils)

- To be used as a preventative treatment (before damage is seen). Not to be used when rain or dew is present.

9. Both pesticide and other alternative control methods and efficacy

- Other options are high-risk sprays. Resistant strains of maize are being investigated, and an initiative to introduce parasitic wasps is underway (but takes time)

Pesticides Evaluation Report for “Bulldock” insecticide

10. Kenya’s ability to regulate or control distribution, storage, use and disposal of the pesticide:

- The necessary acts and regulations are in place to manage pesticides correctly. However, apart from the registration process, there is little or no follow-up by inspection services to ensure and maintain desirable standards.

11. Provisions for training of users and applicators

- Detailed product training will be given to all field staff and extension officers to ensure correct understanding and use. Training will also be given to farmers and contract applicators through the Kenya Maize Development Program.

Pesticides Evaluation Report for “Bulldock” insecticide

12. Methodology to monitor the use and efficacy of the pesticide.

- The field staff will continually monitor the performance of all pesticides used in the KDMP. Each demonstration plot must have all activities documented and records kept of all pesticide use.

SAFER USE ACTION PLAN (SUAP)

The project undertook measures to reduce pesticide use, including:

- Use of pest tolerant/resistant cultivars
- Biotechnology
- Biological control agents such as parasitic wasps, Bt
- Crop rotation
- Training to farmers on pest and disease scouting, economic threshold levels for pests

Comprehensive training program targeting Extension Officers, agrochemical vendors and farmers/families included:

- Clear labeling, safe storage and disposal of pesticides and containers
- Personal protective equipment
- Emergency procedures

The program also coordinated with national initiatives to promote responsible use of pesticides, including radio awareness campaigns

In summary...

Important to understand:

- What local agroecological conditions are exacerbating pest problems
→ improving these may reduce pest loads
- Current local practices → informs decisions on what IPM options are most compatible and lowest-risk in the local context

Important to emphasize:

- **Clear** and effective safer use actions (mitigation) and **monitoring!**

REMEMBER:



If USAID funds are used for the purchase of pesticides, use of pesticides, or technical assistance involving pesticides, a PERSUAP is necessary!