Forest Service Pesticide Risk Assessments

Wildlife and Invasive Plants Symposium, January 31, 2007

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Topics to Cover

- What is a Pesticide Risk Assessment?
- How they are developed?
- Limitations
- How they can be used?
What Is It?

- An analysis and decision-making tool
- Involves a transparent and rational process
- Answers the question: Is there a plausible risk to mammals, birds, etc., from the proposed use of a pesticide
- Provides a basis for risk management and risk communication
Components of Analyzing Risk

- Hazard
- Exposure (Dose)
- Dose-Response Analysis
- Risk Characterization or Assessment

Which leads to Risk Management (not a part of the risk assessment)
Hazard Identification
Exposure Assessment
Dose - Response Assessment
Risk Characterization
Junk Analysis – Commonly Seen

Something is hazardous, therefore it will cause harm.
Hazard (Toxicity)

- **What can the pesticide do?**
- **Data on relatively few species are used to protect the many (we hope)**

*Terrestrial - mammals, birds, invertebrates, plants, soil microorganisms*

*Aquatic - fish, invertebrates, plants, microorganisms, amphibians*
Hazard (Toxicity) - Sources

- **Standard US EPA req’d toxicity tests**
  - Mostly done by registrant
  - Limited range of species
  - Confidential Business Information (CBI)

- **Peer-reviewed literature**
  - Toxicity tests
  - Field studies
  - Efficacy tests

- **Government studies/reports**
Exposure

- **Who gets what and how much?**
- **Relatively few species are analyzed**
  - No reliable exposure assessment
  - No species-specific dose-response data
- **Forest Service developed typical exposure scenarios**
  - Terrestrial and aquatic organisms
  - Direct, indirect contamination
  - Eating, drinking contaminated material
Dose – Response Assessment

- How much is too much?
- Different effects caused by different doses
- Establishing the No Observable Effect Level (NOEL)
- Forest Service uses the lowest NOEL
Risk Characterization

- Is there any reason to worry?
- Forest Service uses Hazard Quotient (HQ)
  - Ratio of exposure to toxicity
  - Toxicity based on No Observable Effect Level (NOEL) or Concentration (NOEC)
  - If HQ < 1, the risk is low
Limitations

- Cannot prove safety
- Analysis is only as good as the data behind it
  - Inert ingredients
  - Mixtures
  - New data
- Surrogate species
- Listed or sensitive species
  - US EPA uses a ‘safety factor’
  - Are sensitive species ‘sensitive’?
How to Use the Risk Assessment

- Shawna Bautista’s presentation
- Excel-based worksheets can be easily customized for each project
  - Generate your own HQ numbers
  - Analyze alternative pesticides
- Risk Assessment leads to Risk Management
Risk Management

So we have numbers that show an unacceptable risk, how do we resolve this?

- Switch to other chemicals or methods
- Label Restrictions
- Timing of applications
- Non-treatment buffers
Summary

- Risk is a function of both hazard and exposure
- FS risk assessments are available for invasive weed applications of herbicides
- Evaluating risk will lead to informed risk management decisions
- Understanding data limitations is critical
Forest Service National Risk Assessments

- www.fs.fed.us/foresthealth/pesticide/risk.shtml
- 14 herbicides, 6 insecticides, 1 fungicide
- Microsoft Excel Worksheets
Questions?

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