Science/Research Break-out Group

SCIENCE/RESEARCH

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Points to Consider

1. Experts should be convened to scope out the areas of uncertainty so that the NARAP on Lindane becomes scientifically defensible.
2. Isomer specific information needs to be gathered and assessed, including soil/sediment biotransformations.
3. Long-range sources need be studied for their potential impacts on North America. Indian sub-continent and Romanian contributions need to be modeled and inventoried.
4. The fate and effects of the 85% process waste (alpha, beta HCH isomers) needs to be taken into account.
5. Contaminated sites need to be addressed, i.e. use sites, stockpiles and production/formulation facilities. Janice Jensen agreed to provide information gathered by John Bigen(sp?)
6. North American and global inventories were undertaken by Li et al. Jay Van Oostdam will provide reference details. *Li, Y.F.A. McMillan and M.T. Scholtz, 1996. Global HCH/Lindane usage with 1' x 1' longitude/latitude resolution. Environmental Science Technology, Vol. 30: 3525-33*
7. It was noted that Canadian atmospheric scientist Terry Bidleman has expertise on local and diffuse sources of Lindane, isomer specific volatilization rates and transport models for the Arctic and North American regions. It was suggested that he be invited to the Alaska public meeting in February.
8. The NARAP should note the impacts of the shift in production of technical HCH vs Lindane
9. There needs to be a concerted effort to verify inventories of all HCH products and raw materials including imports/exports/trans-shipments and product-applied seed amongst all three countries and from other countries.
10. We need to assess pathways of exposure, point and non-point sources; from animal feed or direct animal dermal application to animals to human foodstuffs, from industrial formulating and seed treatment and from applicators in each of the three countries.
11. Aquatic ecosystems need to be assessed, especially wastewater treatment facilities and run-off sources to storm water collectors. The National Mussel Watch initiative needs to be accessed for information on lindane accumulation data if such exists. Is bioaccumulation isomer specific?

12. While atmospheric transport is a concern, the direct application of Lindane product for lice or scabies is likely a more direct health risk.
13. Future research should include efforts to determine the endocrine disrupting properties of all HCH isomers and their ability to impact the human immune system. Available information should be synthesized as a preliminary step. Cumulative and synergistic effects need to be assessed as well as ambient temperature impacts and effects due to nutritional concerns. Vulnerable populations should be examined and assessed; some isomers could preferentially be breast cancer precursors. The global ecosystem needs to be considered as well as indicator species identification in specific regions such as the arctic and riverine estuaries.
14. Alternatives to Lindane need significant scientific assessment and careful consideration for introduction into the economy. USEPA suggested using the heptachlor example as a template for such an initiative. Facilitation of regulations, cooperation and voluntary withdrawal by registrants assisted the removal of heptachlor as a pesticide from the market. Integrated Pest Management (IPM) may also assist in the ultimate displacement of Lindane as a pesticide of choice. Surveillance provides the pressure to comply, farms designated as "organic" will implement alternative methods of pest control. Both the environmental and agricultural departments and agencies need to collaborate and cooperate.
15. Monitoring and reporting needs to be formalized and better coordinated. The USEPA and the FDA need to assess residue measurements and NHANES data for co-relationships. Canada's Total Diet studies need to be reviewed for inclusion of Lindane data and Mexico's imports of seed and exports of treated products may need residue measurements in order to pass upgraded residue standards. The local market in Mexico does not have a residue measurement program. Biomonitoring efforts need to determine the most efficient and effective methodologies and substrates for testing. Concentration in breast milk and cord blood should be studied for relationships whereby one may be a surrogate for the other. We need to ensure that the CEC program remains compatible with the requirements of the Stockholm Convention.
16. Outreach and Education should include training for applicators and operators, all occupational sources of exposure should be assessed and personal use products/pharmaceuticals need to be reevaluated for risk. Integrated Pest Management techniques and protocols need to be communicated to the impacted communities.

Interventions on the Science and Research Break-out Presentation

1. A suggestion to visit the Lindane manufacturing facility in Romania was discussed and tabled for further consideration. The benefits would be to better understand the environmental pathways of all the isomers through a visual reference to the process, the facility infrastructure and the waste management issues.
2. Breast milk needs to be considered as a priority concern for HCH exposure

3. An expert in endocrine disruption capacity of HCH and other organochlorine compounds should be available at the Alaska meeting.
4. Integrated Pest management needs greater commitment and profile from government agencies
5. The Lindane NARAP should pull together and assess current information, not embark on a quest for more research.
6. Reference dose values for both non-carcinogenicity and carcinogenicity of the isomers need to be developed
7. Enantiomers of alpha-HCH may have different toxicities and should be considered for further assessment.
8. Monitoring programs for HCH should include important sub-populations such as street children and indigenous peoples.
9. Application of Lindane to pig stalls may be an important route of exposure for children tending these animals and consuming the meat.