Measuring Progress in the Transition to Biologically-Based IPM

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Reducing public health and environmental risks associated with pesticide use is of growing concern to governments and citizens in developed and developing countries alike. This concern has motivated the call for the adoption of biologically based Integrated Pest Management (IPM) systems, an essential step in reducing risks from use of highly toxic pesticides.

Pest management systems exist along a continuum ranging from those dominated by treatment-oriented practices largely dependent on chemicals, to those mostly reliant on prevention-oriented biological approaches. The diagram below depicts the four zones, or levels of IPM adoption: No, Low, Medium, and High, or biointensive IPM.

An essential step in measuring and monitoring over time the risk reduction impacts of IPM is establishing a baseline of IPM adoption along the continuum. This requires collecting field level data on preventive practices, as well as pesticide use data. A measurement system[1] methodology has been developed to draw upon these data in empirically arraying fields, or farms growing a particular crop along a continuum of IPM systems. Once farms or fields are divided into these four zones, average per acre pesticide use and risk levels within each zone can be estimated and compared. The potential environmental and public health benefits from progress along the IPM continuum can be approximated by subtracting average per acre pesticide use data in the No or Low zone from comparable data drawn from fields in the Medium or High zones.

Incremental progress along the IPM continuum is essential in reducing reliance and use of high-risk pesticides.

No IPM	**← Transitional Systems →**		**High or Biointensive IPM**
	Low	**Medium**	
→ → → Shifting Reliance From Treatment to Prevention → → →			
Chemical Based →→ → → →→ →→ → → → → **Biologically Based**			

Several projects in the United States have demonstrated the linkage between adoption of biointensive IPM and significant pesticide risk reduction. Perhaps the most advanced involves an unprecedented collaboration between with the World Wildlife Fund-U.S. and the Wisconsin Potato and Vegetable Growers Association (WPVGA), an agricultural commodity association made up of 250 growers. WWF-WPVGA have been at work over two years in developing a broad-based program designed to achieve industry-wide reductions in pesticide risk and reliance through the adoption of ecologically –based IPM. In order to ensure public accountability, WPVGA and WWF have worked together to develop and implement a measurement system that will track potato growers' progress in meeting these pesticide reduction and IPM adoption targets.

We will present results based on data collected in 1995 and 1997 on pesticide use in Wisconsin potato production. The project's first-year use reduction goals are applicable to crop season 1997 in contrast to use in 1995. (The U.S. Department of Agriculture did not collect pesticide use data in 1996 on Wisconsin potato farms). Four critical analytical tasks are nearing completion and will be discussed in the presentation**:**

1) **Setting quantifiable risk reduction targets and timetables.** WPVGA has committed to achieving one, three and five year targets for reducing use of specific acutely and chronically toxic pesticides. In addition, five and ten year goals were established for moving growers from No and Low levels to Medium and High levels of IPM adoption.
2) **Defining the IPM continuum.** Working with WPVGA growers, crop consultants and IPM research and extension specialists we identified the IPM continuum for potato production in Wisconsin. The continuum captures the importance of specific IPM practices in contributing to the transition away from treatment and toward prevention-oriented pest management systems in potato production.
3) **Establishing a baseline.** In order to measure changes in pesticide use, risk and reliance over time, we established an industry-wide chemical use baseline using 1995 data. Practice data collected in 1997 and 1998 will generate the baseline of IPM adoption.
4) **Capturing changes in pesticide risk and reliance resulting from IPM adoption.** In order to track changes in pesticide risk, we convert data on the pounds of pesticide active ingredients applied to toxicity adjusted units. The multiattribute toxicity index includes four component indices, each reflecting a broad area of potential risk: acute mammalian, chronic mammalian, ecological, and impacts on beneficial organisms and IPM systems.

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[1] See *Pest Management at the Crossroads*, Benbrook, C. et al., Consumers Union 1996.

*• World Wildlife Fund or Worldwide Fund for Nature, known worldwide by its panda logo, leads international efforts to protect the diversity of life on Earth. Now in its fourth decade, WWF works in more than 100 countries around the globe.

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