The Effectiveness of Farm and Private Sector Initiatives to Reduce Children's Pesticide Exposures

Charles Benbrook, Ph.D
Chief Scientist
The Organic Center

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Private Sector Initiatives to Reduce Pesticide Risks

- Discovery and registration of reduced risk pesticides
- Efforts to implement biointensive IPM systems
- Marketplace rewards
- Growth of the organic industry

? Which have delivered tangible results

? What about future potential to reduce risks

Discovery and Registration of Reduced Risk (RR) Pesticides

EPA has significantly decreased the time that it takes to grant registrations for RR pesticides

26 new a.i.'s registered in 2004:
- 19% conventional, 81% RR
- 14 biopesticides

New Chemistry Since Passage of FQPA

- Nicotinyl insecticides**
- IGRs **
- Spinosad
- Pheromone confusion products **
- Microbial biopesticides (e.g., *Bt*) **
- Others (Indoxacarb, pymetrozin,) **

** No residues found

Profile of a High Risk Pesticide

High-risk OPs and carbamates – chlorpyrifos, methyl parathion, methamidophos, aldicarb, carbofuran

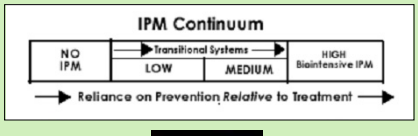
- 0.5 to 1.0 pound rates of application
- High acute and chronic toxicity – three or four zeroes in Reference Doses
- Residues common when applied to fruits and vegetables
- Wide range of ecological risks plus worker risks

Clear Benefits of New Chemistry

Reduced risk alternatives, tree fruits – early OP, an IGR, microbials, mating disruption, plus spinosad

- 0.01 to 0.2 pound rates of application
- 100 to 1,000 times less toxic than risk drivers
- Residues uncommon (except for spinosad, which is low tox)
- Much safer for workers and beneficial insects

Biointensive Integrated Pest Management



USDA Efforts to Promote IPM Solutions to FQPA Problems

Pest Management Alternatives Program (PMAP)

Crops at Risk (CAR)

Risk Avoidance and Management Program (RAMP)

Private Efforts to Promote IPM

Private foundations (Pew, C.S. Mott, W. Alton Jones, Joyce Foundation) – most $$ shifted to biotech projects

Wegmans, in cooperation with Cornell Statewide IPM Program, still going strong

Promoting Adoption of Biointensive IPM

WWF-WPVGA-UW Potato IPM Collaboration

- Developed IPM measurement system
- Set 1, 3, 5 year risk reduction goals
- Calculated pesticide "tox units" based on pounds applied per acre

Biointensive IPM Remains Elusive

- 10% to 25% acreage producing high-value crops in or near the biointensive zone, equal amount at the "low" end of the continuum
- Major challenges to just maintain past progress

IPM's Limited Role in Reducing Pesticide Risks

- Top of everyone's "B" list
- Most IPM systems focused on pesticide use efficiency
- Risk reduction not a core goal
- Public investments are declining and grossly inadequate

Sustained Private Efforts to Reduce Pesticides in Food

- Gerber Products policy -- "no residues in finished product"
- Residue testing and NDR programs by Raleys, H.E. Butt and other supermarkets
- Stemilt "Responsible Choice" program

Food Marketplace Incentives and Ecolabels

Claims are based on:

- Food safety outcomes
- Growing systems & practices

Ecolabel Programs

Categories:

- "Pesticide free" or NDR
- Grown with IPM systems and/or "enviro-friendly" pesticides
- Certified Organic

NDR Based Ecolabels

Misleading claims are common

"Pesticide free"? "Residue free"?

Scientific Certification Systems (SCS) NDR standard = 0.05 ppm

Not "pesticide free", just not over 0.05 ppm

Shortcomings of NDR Labels

Tolerances for high risk pesticides need to be set at 0.01 ppm or lower to meet FQPA standard

Some newly approved biopesticides routinely result in residues above 0.05 ppm (e.g. spinosad, kaolin clay)

Shortcomings of NDR Labels

Residue profiles match conventional produce more closely than organic

Meeting an NDR standard sometimes requires few if any pest management system changes, yet the label suggests that special steps have been taken to reduce risks

"Do Not Use" and "Use with Restrictions" Lists

- Gerber pioneered DNU approach, placements driven by residue findings
- Can be highly effective if strict criteria used
- Wisconsin exceptions allowed for resistance management

HEALTHY GROWN

Marketplace Incentives and Ecolabels

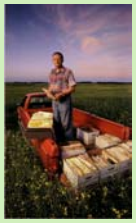
- Most programs lack focus on pesticide risk reduction
- Ecolabel programs, including certified organic, impact modest acreage -- well less than 3% of harvested cropland

  + Certified Organic" accounts for about 2%

- Some programs posed for growth, but still have long way to go to reduce children's pesticide risks

Organic Farming and Food

- Use of toxic, synthetic pesticides prohibited, so relative lack of residues is no surprise
- Lu et al. biomonitoring data confirms that organic food can quickly and dramatically reduce dietary exposures
- Rapid growth in consumer interest and demand, despite government efforts to mask food safety/quality benefits



Food Additives and Contaminants, 2002, Vol. 19, No. 5, 427–446

Pesticide residues in conventional, integrated pest management (IPM)-grown and organic foods: insights from three US data sets

B. P. Baker†, C. M. Benbrook‡, E. Groth III§* and K. Lutz Benbrook‡
†Organic Materials Review Institute, PO Box 11558, Eugene, OR 97440, USA; ‡Benbrook Consulting Services, 5085 Upper Pack River Road, Sandpoint, ID 83864, USA; §Consumers Union of United States, Inc., 101 Truman Avenue, Yonkers, NY 10703-1057, USA

Keywords: pesticide residues, organic foods, integrated pest management-grown foods, contaminants

Introduction

Baker, B., C. Benbrook, E. Groth and K.Benbrook
Food Additives and Contaminants
Volume 19:5, 2002, p. 427

Key Findings in the Baker et al.

- Three-quarters of fresh fruits and vegetables heavily consumed by kids contain residues (PDP data)
- Almost half of these foods contain two or more residues...the average apple has 3.

Baker et. al. Conclusions

"...organic samples are much less likely to contain detectable pesticide residues than conventionally grown or IPM/NDR foods are."

"...differences are clear-cut, consistent across [three] data sets, and highly statistically significant."

"...organic samples in paired comparisons had lower residues about two-thirds of the time."

Why are Prohibited Residues Occasionally Found in Organic Food?

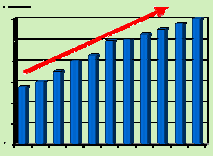
- Pesticides are ubiquitous and can drift
- Contaminated irrigation water
- Soil bound residues of persistent pesticides
- Cross contamination in storage facilities

Essential Ingredients to Reduce Risks through Ecolabels

- Scientific basis for identifying risk reduction targets
- Risk indicators must be quantifiable and measurable at field level
- Standards must define basis for line dividing "acceptable" from "unacceptable" risks
- Compliance verification by a third party
- Information and decision-making must be transparent and accessible

Tracking Post-FQPA Changes in Pesticide Risks

- Consumers Union "Toxicity Index"
- EPA cumulative risk assessment of the OPs
- Need for simple tools to monitor changes in risk levels over time and to identify "risk drivers"



EPA-OIG Evaluation of FQPA Implementation

"Changes Needed to Improve Public Confidence in EPA's Implementation of the Food Quality Protection Act"

Report No. 2006-P-00003 (OIG)
October 19, 2005

EPA-OIG Evaluation of FQPA Implementation

"Opportunities to Improve Data Quality and Children's Health through the Food Quality Protection Act"

Report No. 2006-P-00009 (OIG)
January 10, 2006

EPA-OIG Evaluation of FQPA Implementation

Evaluation Report #3 – assessing the impacts of the FQPA on various measures of dietary risks
Report No. 2006-xxxxxx (OIG)

Due out in Spring 2006

* Benbrook Consulting Services report commissioned by OIG to quantify changes in dietary risks

Tracking Pesticide Dietary Risks

EPA-OIG Dietary Risk Index (DRI) =
(Percent Samples Positive) x (Chronic Risk Share)

Chronic Risk Share = $\frac{\text{Projected 99}^{\text{th}}\text{ Residue Level}}{\text{Single-food cRfC}}$

Chronic Reference Concentration (cRfC) =

$\frac{\text{Size Child (kg) x cPAD (mg/kg/day)}}{\text{Serving Size of Food (kg)}}$

Key Concept: Chronic Risk Share

The CRS is the level of risk associated with the residues of a pesticide found in a food, taking into account the pesticides' toxicity, the amount of food typically eaten, and the mean of the residues found in the positive samples.

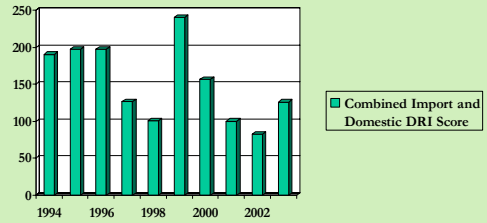
Dietary Risk Index (DRI)

- Applied to 16 foods tested by PDP from 1994-2003 in three sets of residue data -- domestic production, imports, all PDP samples combined
- Each food had to be tested three or more times in this 10 year period

Using the DRI to Track Risks

- Average DRI value per food tested in a year is best indicator to track over time – different numbers of the 16 foods were tested by PDP year-to-year
- Provides an approximation of actual changes in risk levels over time based on much of the same data EPA uses in its dietary risk assessments

Trends in Average DRI Levels per Food Tested Since 1994



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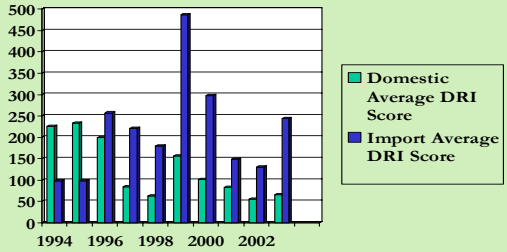

What Works and What Doesn't?

The pesticide industry has delivered several effective, reduced risk pesticides that have provided farmers needed alternatives

IPM has not lived up to its promise because the emphasize has been sustaining the efficacy of pesticide-based systems, not reducing risks

What Works and What Doesn't?

Ecolabel programs are a mixed bag, but collectively impact less than 3% of harvested cropland

Certified organic offers the surest path to significant risk reduction and is poised for even faster growth

Dr. Landrigan will extend the analysis to regulation and the FQPA