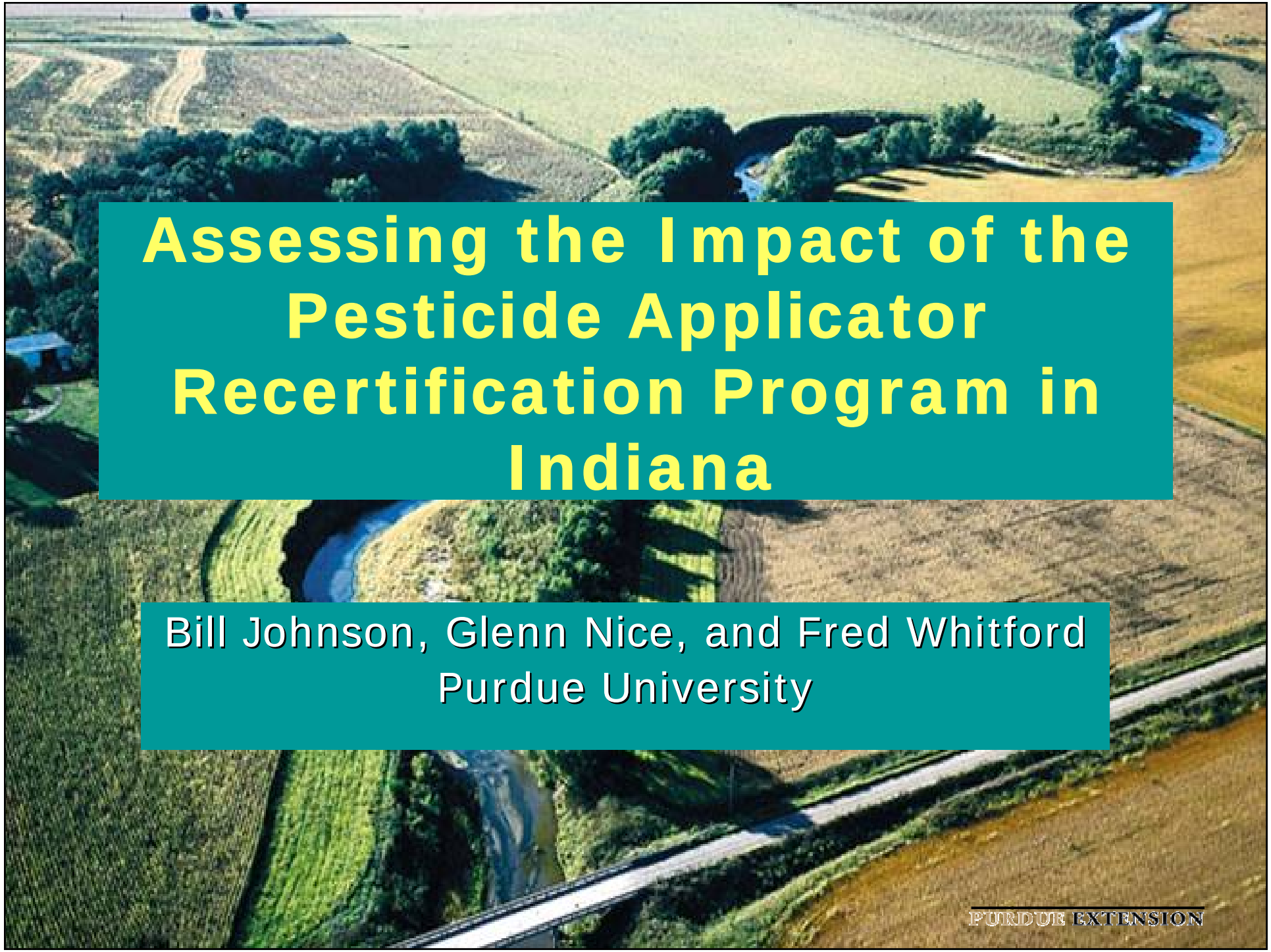


Assessing the Impact of the Pesticide Applicator Recertification Program in Indiana

Bill Johnson, Glenn Nice, and Fred Whitford
Purdue University

PURDUE EXTENSION

Presentation Goals

- Describe the Pesticide Applicator Recertification Program (PARP)
- Discuss the methods used to assess impact of a recent educational topic

History of PARP in Indiana

- Prior to 2000, private applicators were required to retest every 5 years
- Program changed in 2000
  - Driving factor – keep farmers current with pertinent pest/pesticide management topics
  - Either attend 3 meetings in 5 years or retest
  - Cost of attending a meeting is $10 per person
    - County retains $3
    - Purdue Pesticide Programs retains $7
  - County educator develops program
    - Program must be at least 2 hours long (some go as long as 8 hours)
    - Program must include State Chemist approved regulatory topic (30 minutes)
    - Only a Purdue Educator can apply for PARP credits
    - Program is approved by Purdue Pesticide Programs Office (Cheri Jansen)

Regulatory Topics

- Bulk storage
- Drift
  - 33% reduction in drift complaints reaching the OISC office in two consecutive years!
- Restricted use pesticide record keeping
- Atrazine and surface water (todays topic)
- Labels for fungicides (driven by soybean rust)

Current Regulatory Topic – Atrazine and Surface Water

Atrazine Use in Indiana

About 83% of corn acres in 2003

Average rate of 1.25 lb/a

Almost 6 million lb/year

PURDUE EXTENSION

Atrazine: Re-registration

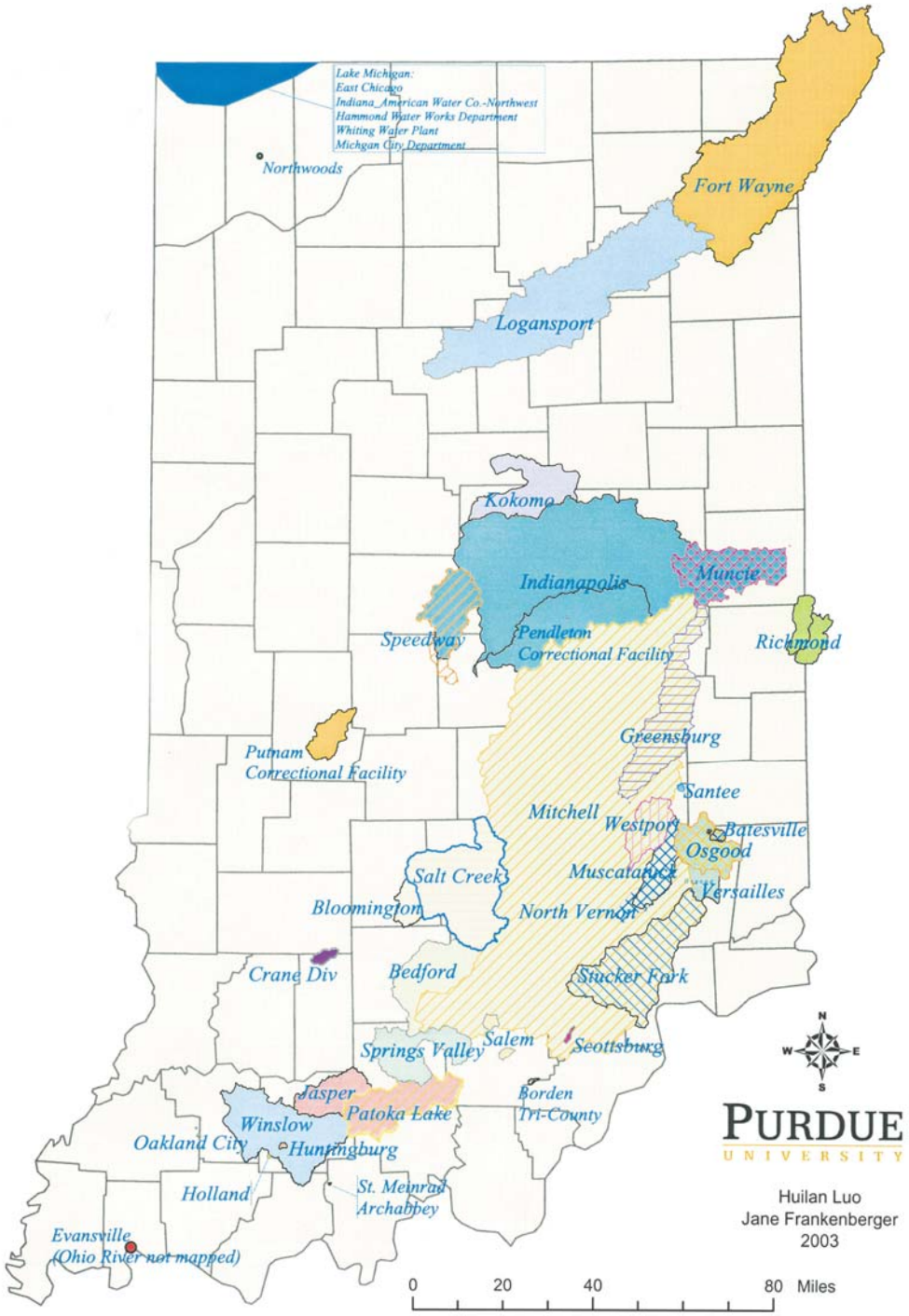
Before 2003

- Atrazine detected in finished water of 47% of public water systems in Indiana (1992-2003)
- Drinking water standard (MCL) set at 3 ppb

2003

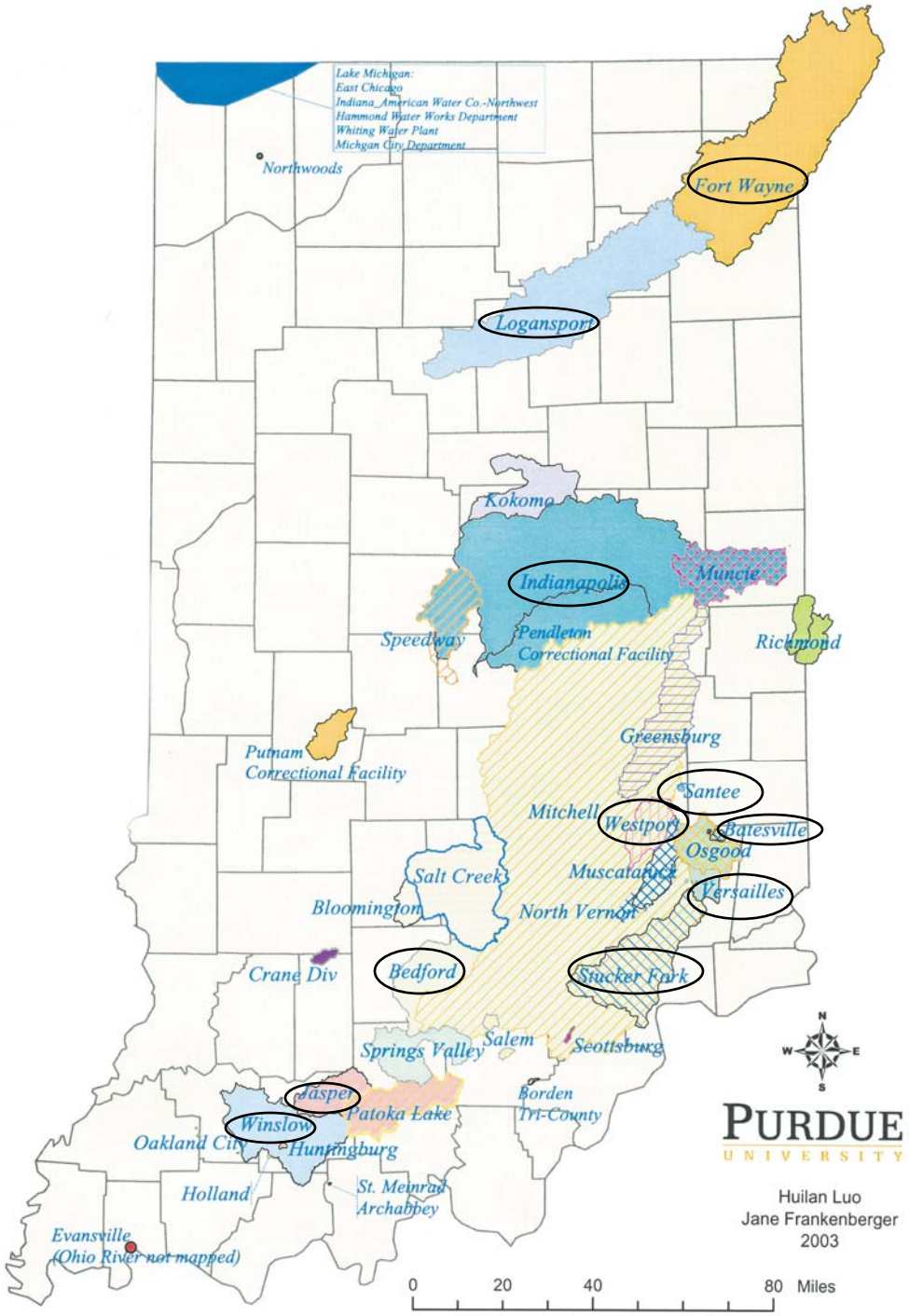
- EPA re-registration, registrants take active role in reducing atrazine in public drinking water.

Indiana Watersheds which Use Surface Water for Drinking



PURDUE EXTENSION

Indiana Watersheds in Atrazine Monitoring Program

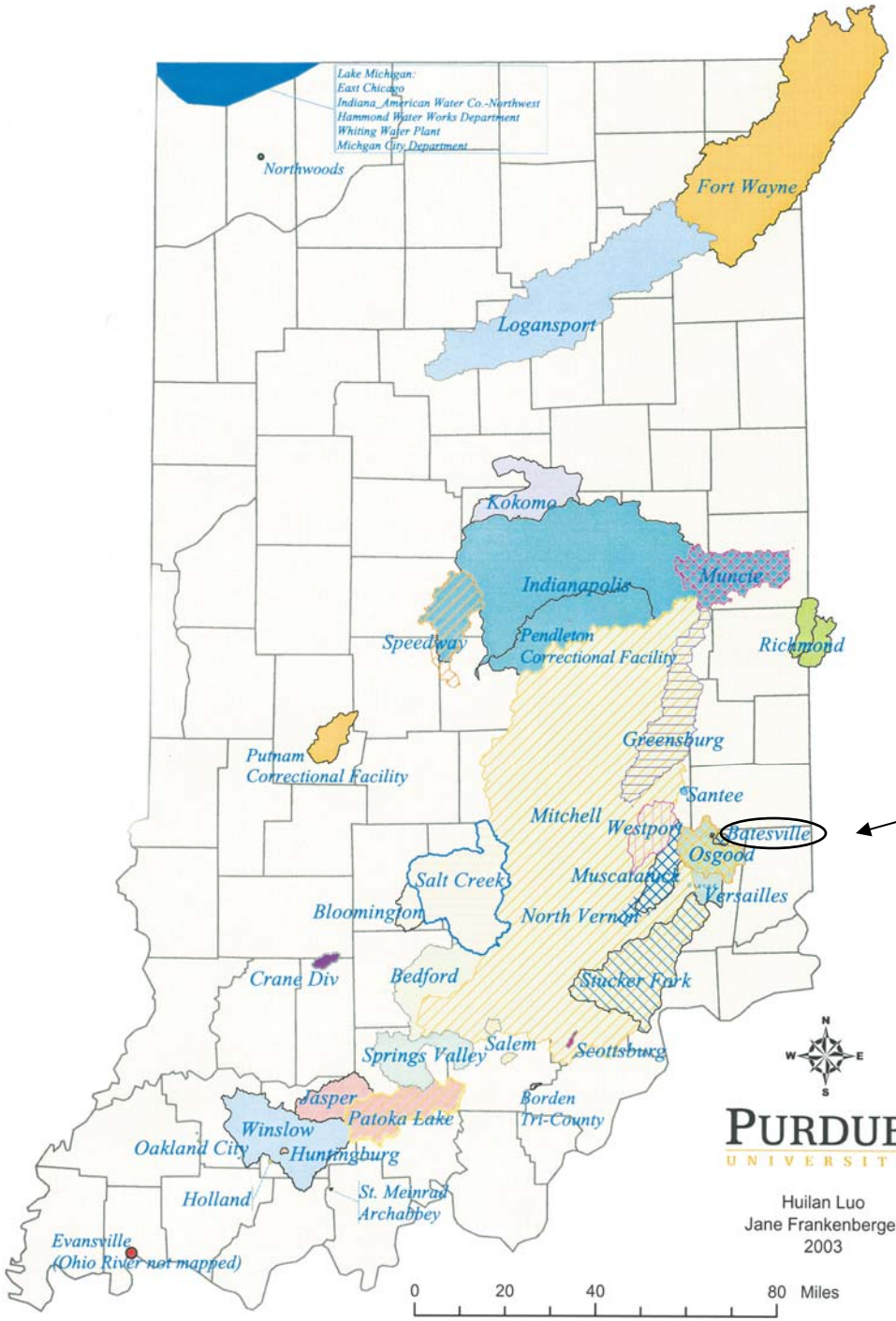


Indianapolis (Eagle Creek)

Batesville	Santee Utilities
Bedford	Stucker Fork
Fort Wayne	Versailles
Jasper	Westport
Logansport	Winslow

PURDUE EXTENSION

Indiana Watersheds with an Atrazine Mitigation Plan



Batesvillle
TWO STRIKES!

PURDUE EXTENSION

Indiana Pesticide Watershed Work Group – established in 2003

- Members include:
  - Purdue Staff
  - Office of the Indiana State Chemist
  - NRCS
  - Water Supply Companies
  - Department of Natural Resources (DNR)
  - Indiana Department of Environmental Management (IDEM)
  - Syngenta
  - Indiana Corn Growers
  - Indiana Farm Bureau
  - Indiana Agribusiness Association
  - others
- Bi annual meetings
- Development of education materials
  - Written publications
  - Powerpoint presentation
    - Trained the County Educators to present the information at their PARP meeting
    - Purdue Pesticide Programs website

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PURDUE EXTENSION

PPP-86

Atrazine and Drinking Water:

Understanding the Needs of Farmers and Citizens

EXPERT REVIEWED

Bill Johnson
Weed Extension Specialist, Botany & Plant Pathology

Fred Whitford
Coordinator, Purdue Pesticide Programs

Leighanne Hahn
Water Quality Specialist, Office of Indiana State Chemist

Dave Flakne
State Government Relations Manager, Syngenta

Jane Frankenberger
Extension Water Quality Specialist, Agricultural & Biological Engineering

Cheri Janssen
Program Specialist, Purdue Pesticide Programs

Tony Bailey
Nutrient/Pest Management Specialist, USDA Natural Resources Conservation Service

Purdue Pesticide Programs

Purdue Extension
Knowledge to Go
1-888-EXT-INFO

PURDUE UNIVERSITY

PURDUE EXTENSION

PPP-87

Atrazine Use and Weed Management Strategies to Protect Surface Water Quality

EXPERT REVIEWED

Purdue Extension
Knowledge to Go
1-888-EXT-INFO

PURDUE EXTENSION

Atrazine Use and Surface Water Concerns

1

Atrazine Use in Indiana

About 83% of corn acres in 2003

Average rate of 1.25 lb/a

Almost 6 million lb/year

2

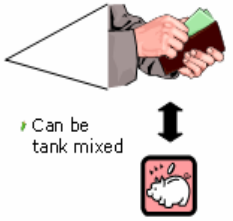
Atrazine

Broad spectrum of weeds

3

Atrazine

- Cost effective
- Limited injury on corn
- PRE and POST
- Can be tank mixed



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List of Agricultural Products Containing Atrazine*

12-2003

5

Why be concerned about Atrazine?

- Solubility — Atrazine 33 mg/L
- Degradation — 45 days on sandy loam soil 77° F
- Metabolites
- Sheer volume used

6

Atrazine: Re-registration

Before 2003

- Atrazine detected in finished water of 47% of public water systems in Indiana (1992-2003)
- Drinking water standard (MCL) set at 3 ppb

CAUTION

2003

- EPA re-registration, registrants take active role in reducing atrazine in public drinking water.

7

New standard set

Part of re-registration new standard set, atrazine and metabolites = total chloro-triazine (TCT) trigger level at 2.6 ppb **annual** average

8

Atrazine Monitoring Program

If public water hits 2.6 ppb TCT in treated tap water obtained from surface water

Water samples taken weekly from April-July (peak season), every-other week (off season)

9

Atrazine Monitoring Program

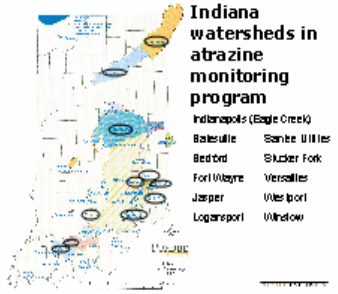
In atrazine monitoring program, watersheds in a 5-year 2 step plan

1) Water analyzed on 90 day rolling average. If average is exceeded, mitigation plan required

2) If average exceeded second time within 5 years, atrazine use will be banned in watershed

10

Indiana watersheds in atrazine monitoring program



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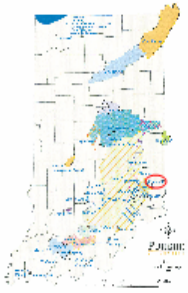
Mitigation Plan

Registrants meet with stakeholders in watershed to develop plan to reduce atrazine in water supplies

12

Atrazine mitigation plan



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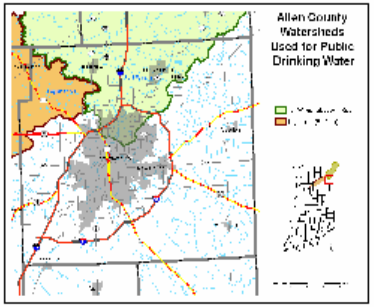

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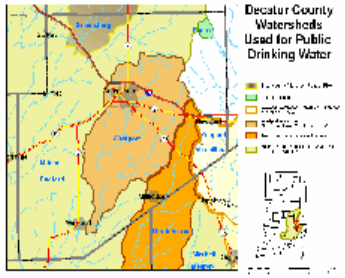

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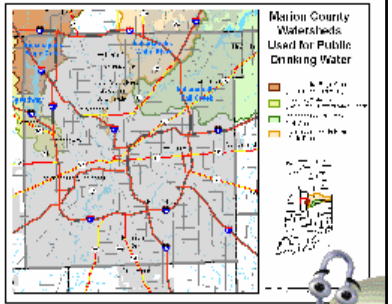


Factors affecting atrazine movement

- **Tillage**
  - **crop residue**

17

Factors affecting atrazine movement

- **Tile**
  - **infiltration**
- Tillage

18

Factors affecting atrazine movement

- **Distance to surface water**
- Tile
- Tillage

19

Factors affecting atrazine movement

- **Precipitation**
- Distance to surface water
- Tile
- Tillage

20

Factors affecting atrazine movement

- **Precipitation**
- **Distance to surface water**
- **Tile**
- **Tillage**

Follow the Label

21

Atrazine Label Setback Requirements – Wells, Sinkholes

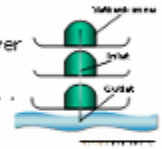
Mix and load 50' away from well heads and sink holes and tile inlets.

22

Atrazine Label Setback Requirements – Standpipe

Do not apply atrazine within 66 feet of any standpipe in a terraced field if the tile outlet is within 66 feet of a point where surface water runoff from the field through the outlet enters a stream or river

unless . . .



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Standpipe setback

You may apply atrazine to an entire terraced field with tile outlets if

- Immediate incorporation to a 2-3"depth
- No-till or other high residue crop management practices are used

24

Atrazine Label Setback Requirements – Surface water

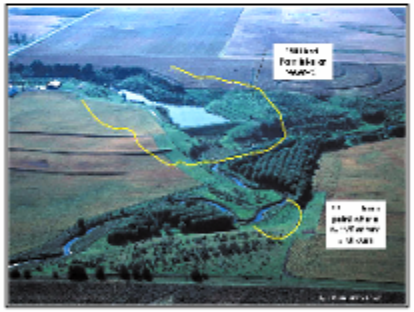
Do not mix or load within 50' of stream or river

Do not apply within 66' where ***runoff enters*** a stream or river

Do not apply 200' of lake or reservoir

25

26



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28

29

Weed Management Tactics

Consider the following suggestions for fields located close to surface water and susceptible to contamination.

30

Weed Management Tactics

- **Incorporate atrazine**

31

Weed Management Strategies

- **Reduce soil-applied atrazine rates and tank mix with other products**
- Incorporate atrazine

32

Tank Mix Choices Control of broadleaf weeds at 40 to 60 days after corn planting

Herbicide Program	Velvetleaf	Giant ragweed	Common lambsquarters	Ivyleaf morning glory	Average
	~~% control ~~~~~~~~~~				
Atrazine	69	75	94	70	77
Balance Pro®	93	90	99	56	85
Hornet WDG®	86	93	99	75	88
Callisto™	99	91	99	90	95
Average	87	87	98	73	

Source: Purdue University Weed Science Research Program 1996-2003

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Weed Management Strategies

- **Substitute other products**
  - Reduce soil-applied atrazine rates and tank mix with other products
  - Incorporate atrazine

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Relative effectiveness of soil-applied atrazine replacements on selected broadleaf weeds

	Annual morningglory	Burcucumber	Cocklebur	ALS-resistant giant ragweed	Triazine-resistant lambsquarters	Velvetleaf	Number of broadleaf weeds controlled
Atrazine	80-89%	80-89%	80-89%	80-89%	No control	80-89%	4
Balance Pro®	Poor control	70-79%	Poor control	80-89%	90-100%	90-100%	3
Callisto™	80-89%	70-79%	Poor control	80-89%	90-100%	80-100%	3
Hornet®	80-89%	Poor control	80-89%	70-79%	90-100%	90-100%	4
Python®	Poor control	Poor control	70-79%	No control	90-100%	80-89%	3

Source: 2004 Weed control Guide for Ohio and Indiana, WS-16

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Weed Management Strategies

- **Zone herbicide application**

- Substitute other products
- Reduce soil-applied atrazine rates and tank mix with other products
- Incorporate atrazine

36

Zone herbicide application

- Different herbicide rates applied between-row and in-row
- Total amount applied reduced up to 47% with no loss in weed control or crop yield.

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Weed Management Tactics

- **Use atrazine postemergence**
  - Zone herbicide application
  - Substitute other products
  - Reduce soil-applied rates and tank mix with atrazine
  - Incorporate atrazine

38

Relative effectiveness of atrazine applied pre- vs. postemergence

Atrazine Application at Labeled Rates	Pre	Post
Annual morningglory	80-89%	90-100%
Burcucumber	60-69%	80-89%
Common cocklebur	80-89%	90-100%
ALS-resistant giant ragweed	80-89%	80-89%
Velvetleaf	80-89%	80-89%

Source: 2004 Weed control Guide for Ohio and Indiana, WS-16

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Weed Management Tactics

- **Use herbicide-resistant corn varieties**
  - Use atrazine post emergence
  - Zone herbicide application
  - Substitute other products
  - Reduce soil-applied rates and tank mix with atrazine
  - Incorporate atrazine

40

Weed Management Tactics

What doesn't work

Early preplant applications

41

Influence of Bicep® application date on weed control and yield

Application date (days before planting)	Weed Control %	Corn yield bushels/A
At planting	73	148
15	56	126
30	57	114
45	52	123

Source: Mourity, MO 1981-1984, University of Missouri

42

- Concerns of atrazine
- Label setbacks
- Weed control strategies

Assistance is available

43

Financial Assistance

Continuous Conservation Reserve Program (CRP) – Farm Service Agency and Natural Resources Conservation

- Buffers and filter strips
- Eligible acres receive annual rental payment and cost share for establishment (10 to 15 years)

317/290-3030 (State office)
http://www.fsa.usda.gov/IN

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Financial Assistance

Environmental Quality Incentive Program (EQIP) – Natural Resources Conservation Service and the Farm Service Agency

Storage Facility	Filter Strip
Grassed waterways	Pest management
Residue management	Well plugging

http://www.in.nrcs.usda.gov/programs/2003/eqip.html
317/290-3200 (State office)

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Financial Assistance

Lake and River Enhancement (LARE) – Indiana Department of Natural Resources, Division of Soil Conservation

In selected watersheds around the state, a filter strip incentive payment and/or pest management may be available

http://www.in.gov/dnr/soilcons/programs/lare.html
317/233-3870 (State office)

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Let's keep this valuable tool

Use Atrazine Wisely

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Other Topics Covered in a PARP Meeting

- Weed management
- Insect management
- Plant pathology
- Pesticide safety

My understanding of atrazine and surface water issues in Indiana

	Very well	Some insight	Not at all	No answer
	----------%			----------
Before Program	34	56	6	4
After Program	60	27	4	9

(n=1987)

How important are atrazine-containing products in your weed management program?

Very important	Important	Not important	No answer
%			
51	40	6	3

(n=1987)

PURDUE EXTENSION

If you could not apply atrazine, how much more ($/A) would you expect to spend for corn herbicides?

0$	2$	4$	6$	8$	10$	Don't know	No answer
%							
2	2	10	20	21	33	5	7

(n=1987)

PURDUE EXTENSION

Consider your field most at risk for atrazine movement to surface water. What strategies would you likely adopt next planting season to reduce atrazine movement?

Tactic	%
Follow setback instructions on label	38
Establish filter strips around surface water	31
Reduce rates by tankmixing atrazine with other products	28
Don't spray around drainage tiles	28
Don't apply when heavy rains are forecast	25
Switch to reduce tillage systems to leave more residue	22
Plant herbicide-resistant corn varieties	18
Look for financial assistance for filter strips, CRP	16
Do not apply atrazine to that field	16
Incorporate after application	16

(n=1987)

Conclusions

- We were a bit behind the curve on the atrazine issue
- We understand how important atrazine is to Indiana farmers

  …and that they generally don't understand the label of their most important corn herbicide
- Our educational program did increase their knowledge of this topic. We will conduct follow up surveys to see if they actually did what they indicated they would do.
- Indiana PARP is a "*good thing*"
  - Maintain contact with the farmer
  - Provide unbiased interpretation of regulatory issues
  - Purdue Staff provide assistance with pest management issues – keep the farmers current!
  - We learn about our clientele