

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460



**Chemical: Fluometuron**  
**PC Code: 035503**  
**DP Barcode: DP 321922**  
**Date: September 27, 2005**

**Subject: Revised drinking water assessment and EFED's Response to Exponent, Inc "SCI-GROW Modeling for Fluometuron and Its Primary Metabolite, Desmethyl Fluometuron; and NAWQA Monitoring Data on Fluometuron".**

**To:** Michael Goodis, Chief  
Reregistration Branch III  
Special Review & Reregistration Division (7508C)

Kylie Rothwell, Risk Manager Reviewer  
Reregistration Branch III  
Special Review & Reregistration Division (7508C)

Elissa Reaves, Toxicologist  
Samuel Ary, Chemist  
Reregistration Branch II  
Health and Effects Division (7509C)

**From:** Ibrahim Abdel-Saheb, Ph.D., Environmental Scientist      Signature:  
Environmental Risk Branch II      Date:  
Environmental Fate and Effects Division (7507C)

**Reviewed**  
**By:** Dana Spatz, RAPL      Signature:  
Environmental Risk Branch II      Date:  
Environmental Fate and Effects Division (7507C)

**Approved**  
**By:** Tom Bailey, Ph.D., Branch Chief      Signature:  
Environmental Risk Branch II      Date:  
Environmental Fate and Effects Division (7507C)

**Summary**

This memo summarizes EFED's revised drinking water assessment for Fluometuron (Chemical Name [1,1-dimethyl-3-(alpha, alpha, alpha-trifluoro-m-tolyl)urea] and its major metabolite (CGA-41686) based on the new proposed application rates. In addition, EFED considered Exponent, Inc documents titled "NAWQA Monitoring Data on Fluometuron and SCI-

GROW Modeling for Fluometuron and Its Primary Metabolite, Desmethyl Fluometuron”, dated August 1 and 12, respectively, in this update.

## Fluometuron Modeling Results

### PRZM/EXAMS Modeling for Drinking Surface water

Table 1. Estimated environmental concentrations of Fluometuron plus its degradate (CGA-41686) in surface use on cotton.				
	Model EECs (µg/L)			
	CA	TX	MS	NC
Surface water/ peak (90 <sup>th</sup> percentile annual daily max.)	13.8	15.5	31.2	14.1
Surface water/ 90 <sup>th</sup> percentile annual mean)	10.9	6.38	6.34	4.60
Surface water/ 36-year overall mean	9.30	3.84	2.54	3.56
use(s) modeled	3 lbai/A*	2 lbai/A	3 lbai/A	2 lbai/A
	Based on the revised use pattern (as described below)			
PCA	0.2			

\*: Application rates used were based on soil series description in each PRZM input file.

### Sci-Grow modeling results for fluometuron and desmethyl fluometuron following broadcast applications to cotton.

Scenario	Fluometuron (µg/L)	Desmethyl Fluometuron (µg/L)	Fluometuron plus Desmethyl Fluometuron (µg/L)
Light soil	12.5	9.09	21.6
Intermediate soil	18.8	13.6	32.4
Heavy soil	11.8	11.0	22.8

<b>Soil Texture</b>	<b>Max Application rate (1x)</b>	<b>Number of Applications</b>	<b>Seasonal Max. Rate</b>	<b>Application Interval</b>
Sand, Loamy Sand, Sandy Loam	<b>1 lb ai/A</b>	<b>2</b>	<b>2 lb ai/A</b>	<b>20 days</b>
Loam, Silt Loam, Silt, Sandy Clay Loam, Silty clay loam, Clay loam	<b>1.6 lb ai/A</b>	<b>2</b>	<b>3 lb ai/A</b>	<b>20 days</b>
Sandy clay, Silty Clay, Clay	<b>2 lb ai/A</b>	<b>2</b>	<b>3 lb ai/A</b>	<b>20 days</b>

### **NAWQA Monitoring Data Characterization**

NAWQA data used in this summary was based on the following to reduce bias introduced by inclusion of counties where fluometuron historically was not likely to have been used:

- Included only those counties within states with:
  - High cotton area planted in 2004 (counties with >100,000 acres) (see map in Appendix A), and
  - Historic high use of fluometuron on cotton ( $\geq 7.869$  lb ai/mile<sup>2</sup>), see map in Appendix A.
- Estimated application rate (average a.i./mile<sup>2</sup>) were relatively similar across years for these states (Appendix A).
- EPA Source data and USDA NASS data (1993-2004) (Appendix A).
- NAWQA data from 1993 through 2004

## **GROUNDWATER NAWQA RESULTS**

### **Arkansas**

#### **Parent**

- Total of 18 samples (from different wells); 7 of them were collected in 1996, and 11 in 1998.
- 4 samples were collected in April; and 3 in May; 3 in June; and 8 in July.
- All sites were mixed use;
- No detects in all samples ( $\sim < 0.35$  ppb).

#### **TFMA**

- For the study period from 1993-2003; a total of 7 samples were collected; 5 in 1996 and 2 1998.
- 4 samples were collected in April, 1 sample in May, 1 in June, and 1 in July.
- Detections in all samples ( 9.91-81.0 ppb).
- All sites were mixed use.

## **Mississippi**

### **Parent**

- Total of 17 samples from different wells; 5 of them were collected in 1996, and 12 in 1998.
- 5 samples were collected in April, 11 in June, and 1 in July (fluometuron is typically applied in May)
- All sites were mixed use
- No detects in all samples ( $\sim < 0.35$  ppb).

### **TFMA**

- Total of 4 samples; 3 of them were collected in 1996, and one sample in 1998.
- Three samples were collected in April 1996, and one sample in July 1998.
- Detections in all samples ( 40.0 - 112.0 ppb)
- All sites were mixed use.

## **North Carolina**

### **Parent**

- Total of 34 samples; 14 of them were collected in 1993, 18 in 1994, and 2 in 2002.
- Two were collected in February, 7 in March, 1 in May, 1 in June, 15 in August, and 8 in September
- Sites consisted of 4 mixed land use, 1 agricultural use, and 29 other use.
- Total of 3 detects ranging from 0.08 - 0.35 ppb.

### **TFMA**

- Total of 61 samples were collected; 12 in 1993, 18 in 1994, 26 in 1995, 3 in 2002, and 2 in 2003.
- Seven samples were collected in mixed use areas; and 1 in agricultural use areas; and 53 in other use areas.
- Detections in all samples ( 26.3 - 0.07 ppb)

## **Texas**

### **Parent**

- Total of 42 samples; 21 of them were collected in 2001 and 21 in 2003.
- 20 were collected in February, 1 in March, 15 in August, and 6 in September
- 21 samples from mix land use, and 21 from agricultural land use.
- Total of 2 detects (one is an estimated value of 0.0068 ppb), and the other detect was 0.06 ppb.

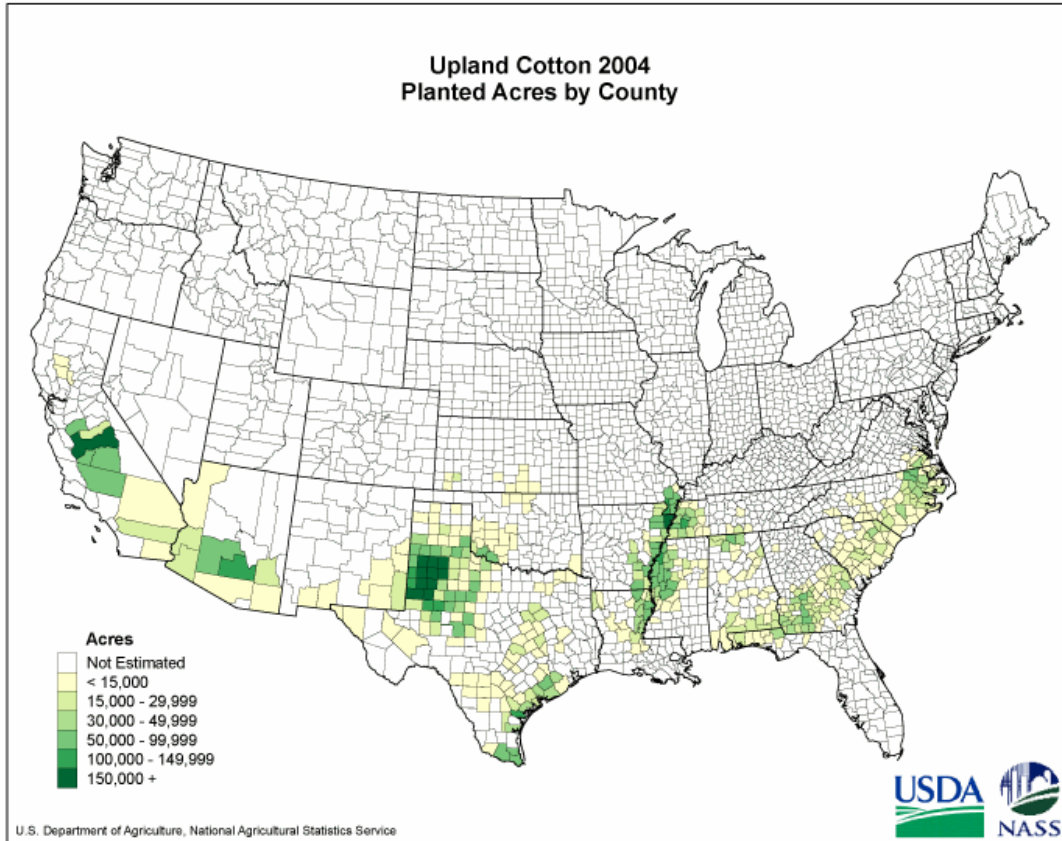
### **TFMA**

- Total of 55 samples were collected; 22 samples in 2001 (in mixed use areas), 4 in 2002 (Agricultural use areas), and 29 in 2003 (other use areas).
- Detections in all samples ( 33.6 - 288 ppb)

### **Summary**

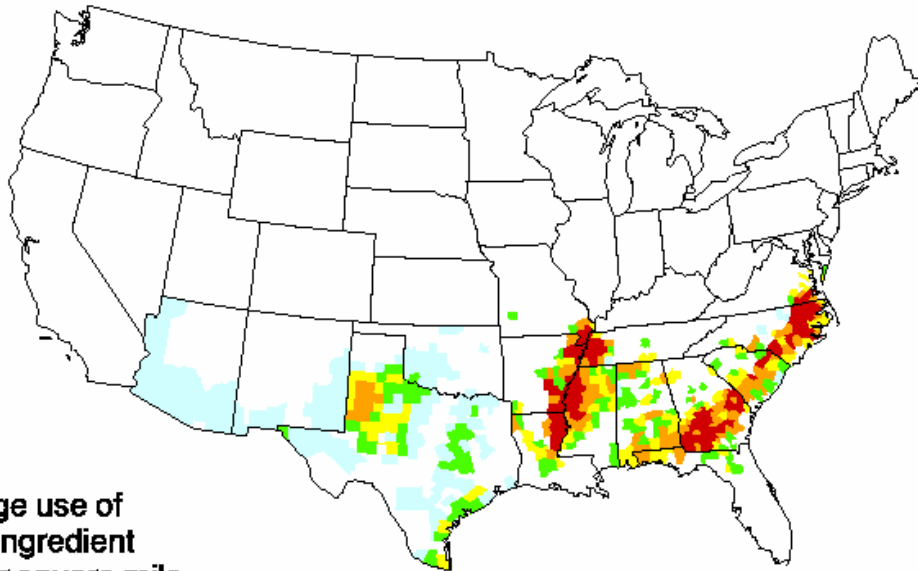
- Groundwater monitoring data are limited spatially and temporally in cotton and fluometuron use areas to extract useful information about expected fluometuron concentration in drinking water in use areas.
- Therefore, at this time EFED believes that at the absence of a representative monitoring data, the use of modeling results for ground and surface water would be more appropriate.

## APPENDIX A: SOURCES OF DATA



# FLUOMETURON - HERBICIDES

## ESTIMATED ANNUAL AGRICULTURAL USE

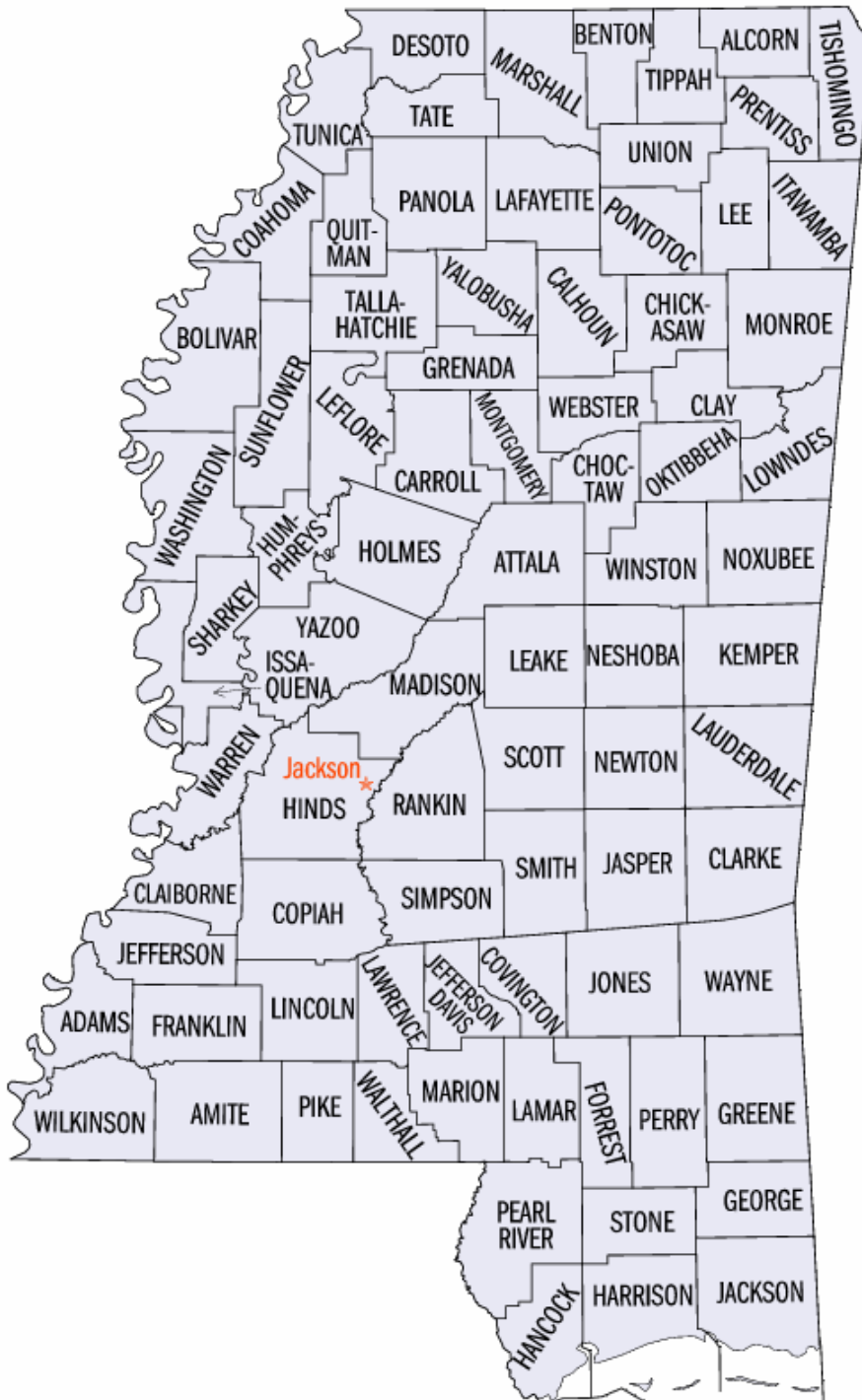


**Average use of  
Active Ingredient  
Pounds per square mile  
of county per year**

- No Estimated Use
- < 0.506
- 0.506 - 2.779
- 2.780 - 10.095
- 10.096 - 31.711
- $\geq 31.712$

Crops	Total Pounds Applied	Percent National Use
cotton	5,270,325	100.00

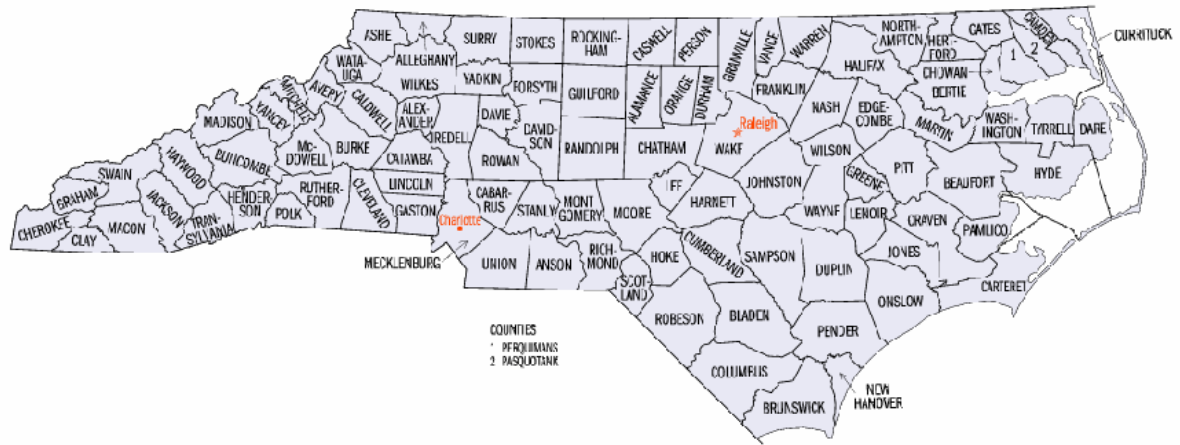
# Mississippi



# Arkansas



# North Carolina





**Usage Characterization for Fluometuron 1993-2004**

<b>Year</b>	<b>State</b>	<b>A.I. Applied Rate Range (lbs/Year)</b>	<b>Average A.I Application Rate</b>
<b>1993</b>	Arkansas	650,000 - 750,000	0.5
1993	Louisiana	400,000 - 500,000	0.6
1993	Mississippi	1,000,000 - 1,250,000	0.6
1993	Texas	100,000 -150,000	0.6
<b>1994</b>	Arkansas	650,000 - 750,000	0.6
1994	Louisiana	700,000 - 800,000	0.8
1994	Mississippi	1,000,000 - 1,250,000	0.6
1994	Texas	500,000 - 600,000	0.7
1995	Alabama	400,000 -500,000	0.8
1995	Arizona	5,000 - 10,000	0.8
1995	Arkansas	900,000 - 1,000,000	0.7
1995	Florida	50,000 - 100,000	1
1995	Georgia	1,000,000 - 1,250,000	0.8
1995	Idaho	1,000 - 5,000	2.1
1995	Louisiana	500,000 - 600,000	0.6
1995	Mississippi	1,000,000 - 1,250,000	0.8
1995	Missouri	300,000 - 400,000	1
1995	North Carolina	550,000 - 650,000	1
1995	Oklahoma	10,000 - 15,000	0.6
1995	South Carolina	300,000 - 400,000	1
1995	Tennessee	700,000 - 800,000	1.1
1995	Texas	350,000 - 450,000	0.8
1995	Virginia	75,000 - 100,000	1
1996	Alabama	400,000 - 500,000	0.8
1996	Arizona	25,000 - 50,000	1
1996	Arkansas	550,000 - 650,000	0.6
1996	Florida	25,000 - 75,000	0.7
1996	Georgia	850,000 - 1,200,000	0.8
1996	Louisiana	450,000 - 550,000	0.6
1996	Mississippi	700,000 - 800,000	0.7
1996	Missouri	250,000 - 350,000	0.8
1996	New Mexico	2,500 - 7,500	0.5
1996	North Carolina	550,000 - 650,000	0.9
1996	Oklahoma	4,000 - 6,000	0.7
1996	Pennsylvania	0-500	0.5

1996	South Carolina	200,000 - 300,000	1
1996	Tennessee	500,000 - 600,000	1.1
1996	Texas	200,000 - 300,000	0.8
1996	Virginia	85,000 - 125,000	1.1
1997	Alabama	300,000 - 400,000	0.8
1997	Arizona	0 - 5,000	0.8
1997	Arkansas	350,000 - 450,000	0.7
1997	California	10,000 - 20,000	1
1997	Florida	20,000 - 30,000	0.7
1997	Georgia	850,000 - 1,200,000	0.7
1997	Kansas	0 - 5,000	0.5
1997	Louisiana	400,000 - 500,000	0.9
1997	Mississippi	600,000 - 700,000	0.7
1997	Missouri	150,000 - 250,000	0.7
1997	Nebraska	0 - 5,000	1
1997	North Carolina	600,000 - 700,000	0.9
1997	Oklahoma	10,000 - 30,000	0.8
1997	South Carolina	200,000 - 300,000	0.8
1997	Tennessee	450,000 - 550,000	1.1
1997	Texas	400,000 - 500,000	0.8
1997	Virginia	90,000 - 100,000	1
1998	Alabama	200,000 - 300,000	0.8
1998	Arizona	2,500 - 7,500	0.8
1998	Arkansas	500,000 - 600,000	0.7
1998	Florida	25,000 - 35,000	1
1998	Georgia	500,000 - 600,000	0.8
1998	Kansas	0 - 5,000	1.2
1998	Louisiana	450,000 - 550,000	0.8
1998	Mississippi	600,000 - 700,000	0.8
1998	Missouri	200,000 - 300,000	1.1
1998	New Mexico	9,000 - 10,000	0.8
1998	North Carolina	250,000 - 350,000	1
1998	Oklahoma	2,500 - 7,500	1

1998	South Carolina	150,000 - 250,000	1.2
1998	Tennessee	350,000 - 450,000	1.1
1998	Texas	350,000 - 450,000	1
1998	Virginia	50,000 - 100,000	1.1
1999	Alabama	100,000 - 200,000	0.8
1999	Arizona	2,500 - 7,500	0.5
1999	Arkansas	300,000 - 400,000	0.7
1999	California	90,000 - 100,000	2.2
1999	Florida	0 - 5,000	1
1999	Georgia	350,000 - 450,000	0.7
1999	Kansas	10,000 - 15,000	1.1
1999	Louisiana	250,000 - 350,000	0.7
1999	Mississippi	650,000 - 750,000	0.7
1999	Missouri	100,000 - 200,000	0.6
1999	North Carolina	300,000 - 400,000	0.9
1999	Oklahoma	2,500 - 7,500	0.7
1999	South Carolina	100,000 - 200,000	1
1999	Tennessee	250,000 - 350,000	0.9
1999	Texas	300,000 - 400,000	0.9
1999	Virginia	50,000 - 100,000	0.9
2000	Alabama	100,000 - 200,000	0.8

2000	Arizona	0 - 5,000	0.8
2000	Arkansas	300,000 - 400,000	0.7
2000	Florida	10,000 - 15,000	1
2000	Georgia	200,000 - 300,000	0.8
2000	Kansas	25,000 - 50,000	1.4
2000	Louisiana	250,000 - 350,000	0.7
2000	Mississippi	400,000 - 500,000	0.7
2000	Missouri	100,000 - 200,000	0.6
2000	North Carolina	350,000 - 450,000	0.9
2000	Oklahoma	0 - 5,000	1
2000	South Carolina	50,000 - 100,000	0.9
2000	Tennessee	85,000 - 125,000	0.9
2000	Texas	250,000 - 350,000	0.8
2000	Virginia	50,000 - 100,000	1
2001	Alabama	35,000 - 55,000	0.8
2001	Arkansas	150,000 - 250,000	0.6
2001	Florida	0 - 5,000	1
2001	Georgia	100,000 - 200,000	0.7
2001	Louisiana	100,000 - 200,000	0.8
2001	Mississippi	200,000 - 300,000	0.7
2001	Missouri	50,000 - 100,000	0.7

2001	New Mexico	0 - 5,000	1
2001	North Carolina	150,000 - 250,000	0.8
2001	Oklahoma	0 - 5,000	1
2001	South Carolina	25,000 - 75,000	0.9
2001	Tennessee	50,000 - 100,000	0.7
2001	Texas	250,000 - 350,000	0.8
2001	Virginia	25,000 - 75,000	0.9
2002	Alabama	10,000 - 30,000	0.7
2002	Arizona	2,500 - 7,500	0.9
2002	Arkansas	100,000 - 200,000	0.6
2002	Georgia	50,000 - 100,000	1
2002	Louisiana	25,000 - 75,000	0.6
2002	Mississippi	150,000 - 250,000	0.8
2002	Missouri	50,000 - 100,000	0.6
2002	New Mexico	0 - 5,000	0.4
2002	North Carolina	100,000 - 200,000	0.9
2002	Oklahoma	0 - 5,000	0.8
2002	South Carolina	50,000 - 100,000	0.7
2002	Tennessee	25,000 - 75,000	0.6
2002	Texas	150,000 - 250,000	0.8
2002	Virginia	20,000 - 50,000	0.9

2003	Alabama	25,000 - 75,000	0.8
2003	Arkansas	50,000 - 100,000	0.6
2003	Georgia	25,000 - 75,000	0.8
2003	Kansas	0 - 5,000	1.5
2003	Louisiana	25,000 - 75,000	0.9
2003	Mississippi	50,000 - 100,000	0.6
2003	Missouri	25,000 - 50,000	0.6
2003	North Carolina	75,000 - 100,000	1
2003	Oklahoma	0 - 5,000	0.4
2003	South Carolina	25,000 - 50,000	0.8
2003	Tennessee	25,000 - 50,000	0.7
2003	Texas	150,000 - 250,000	0.9
2003	Virginia	10,000 - 30,000	1.3
2004	Alabama	50,000 - 100,000	0.9
2004	Arkansas	10,000 - 30,000	0.5
2004	Georgia	50,000 - 100,000	0.9
2004	Kansas	7,500 - 15,000	0.8
2004	Louisiana	25,000 - 50,000	0.8
2004	Mississippi	150,000 - 250,000	1.2
2004	Missouri	5,000 - 15,000	0.9
2004	North Carolina	25,000 - 50,000	1
2004	South Carolina	25,000 - 75,000	0.6

2004	Tennessee	50,000 - 100,000	1
2004	Texas	150,000 - 250,000	1
2004	Virginia	5,000 - 15,000	0.8

Source: EPA Source data and USDA NASS data (1993-2004)

\* Ranges have been given to protect proprietary data.

All figures have been rounded and averaged where ever possible