IV.
How North Carolina Stacks Up Against Other States in the Regulation of Pesticides

by Tom Mather

One of the key questions guiding the Center's look at pesticide regulation was: How does North Carolina's pesticide program compare with those in other states? To answer that question, the Center sent a comprehensive survey to all 50 state pesticide programs. The survey found that North Carolina's program was among the most comprehensive in the breadth of its responsibilities and extent of its regulatory powers. North Carolina also ranked high in spending and staffing for pesticide programs, as well as in various measures of regulatory activity—including total fines assessed on violators, the number of applicator licenses suspended or revoked, and the number of complaints investigated. The survey also showed areas where the state was lagging, such as record-keeping requirements for pesticide applicators and the training needed for applicators to obtain and renew their licenses and certifications.

One of the primary goals of the Center's look at pesticide regulation was to assess how North Carolina's pesticide program compares with those in other states. A review of previous research sheds little light on the topic. Most studies of pesticide regulation have focused on federal legislation and its implementation by the U.S. Environmental Protection Agency (EPA). That's because the primary federal pesticide law, the Federal Insecticide, Fungicide, and Rodenticide Act, or FIFRA, authorizes the EPA to regulate pesticides and their uses.[1] Under FIFRA, the EPA is directed to register pesticide products, specify their proper uses, and remove unreasonably hazardous pesticides from the marketplace.

Despite the EPA's overriding authority, the federal agency has delegated to the states much of the responsibility for implementing pesticide laws and regulations. But only a few studies have examined the states' roles in regulating pesticide use, and most of those studies have been

Mark Wasmer, Farmworkers Legal Services of N.C.

conducted by environmental or public interest groups.[2]

The N.C. Center for Public Policy Research reviewed previous studies as part of its analysis of state pesticide programs. However, the Center decided to do original research in a new survey of state pesticide programs for several reasons: to assure the fairness, accuracy, and quality of the data; to obtain the most up-to-date information possible; to provide more in-depth information than afforded by previous studies; and to give state pesticide administrators an opportunity to review and comment on the results. The Center also assumed that state pesticide administrators would be most knowledgeable about the details of their programs.

Study Methodology

The Center prepared a draft survey of state pesticide programs in April 1993 based on interviews with pesticide authorities and consulting previous research on the topic. More than two dozen people reviewed our preliminary survey, and we incorporated many of their comments and suggestions. Those reviewers covered a wide spectrum of interests, including government regulators, researchers, farmers, agri-business representatives, environmentalists, farmworker advocates, and legislators.

A revised survey was mailed during July 1993 in a five-state test run that was used to fine tune the questions. The final survey included 42 questions in nine broad categories: general information; licensing and certification; record keeping; environmental concerns; farmworker safety and health; administration; regulatory authority; aerial application of pesticides; and miscellaneous information. We mailed the final survey in August 1993 to administrators of the lead pesticide programs in the remaining 45 states. A follow-up mailing was sent to states that had not responded by late September 1993.

The response was near complete, with surveys filled out by 45 states (90 percent)—representing every section of the country. By region, our response rate was: 100 percent from the Northeast, 94 percent from the South, 85 percent from the West, and 83 percent from the Midwest. States that did not respond to the survey were: Arkansas, Idaho, Illinois, Indiana, and New Mexico.

Some of the states that responded to the survey did not complete all of the questions. For example, six of the participating states didn't provide information on their budgets, and eight states didn't tell us the amount of fines they assess. Nevertheless, each question on the survey was answered by at least 36 states, and many questions by all 45 respondents.

The survey results are presented here in three ways: 50-state tables that list responses for each state; summary tables that consolidate answers from all of the respondents; and "Top-10" tables that rank states according to measurable criteria, such as the size of their budgets. In the Top-10 lists, states were ranked by total numbers as well as by amounts when adjusted for population and acres of harvested crops.[3] Rankings were adjusted to take into account the wide differences in population and agricultural activity among the states. For instance, California had the highest total pesticide budget among the survey respondents—which is not surprising since it is the nation's most populous state and a leading agricultural producer. However, North Dakota ranked first when pesticide budgets were divided by state populations, and Rhode Island ranked first when budgets were divided by state crop acreages. Populations and acres of harvested crops for each state were taken from 1990 data published by the U.S. Bureau of the Census.[4]

The Center's survey provides a comprehensive overview of state pesticide programs. Some of the highlights are listed in Table 12 on pp. 64–65, as well as the populations and acres of crops harvested for each state as reported in the 1990 U.S. Census.

Resources Available to Pesticide Programs

The average state pesticide program had a budget totaling nearly $2.7 million with 33 employees in fiscal year 1992–93, based on the 39 states that provided budget information in the Center's survey. (See Table 12 on pp. 64–65.) However, the resources available to pesticide programs vary widely, ranging from Nebraska's $85,000 budget and two-person staff[5] to California's $44-million budget and 372-person

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Farmworkers are among those most susceptible to potential harm from toxic pesticides. Yet the Center's survey found that less than one-fourth of the states had programs for educating farmworkers about pesticide safety.

Table 12. Highlights of Lead Pesticide Programs by State[1]

State	Type of Lead Pesticide Agency[2]	Total Budget, FY 92–93	Total Budgeted Staff, FY 92–93	Total Product Registration Fees[3]	Over-sight Board?[4]	Total State Population, 1990[5]	Acres of Crops Harvested 1990[6]
Alabama	Agriculture	NA	18	$870,000	No	4,041,000	2,342,000
Alaska	Environment	$307,000	4	0	No	550,000	NA
Arizona	Agriculture	$1,621,164	29	$180,000	No	3,665,000	802,000
Arkansas	Agriculture	NR	NR	NR	NR	2,351,000	8,080,000
California	Environment	$44,050,000	372	$2,054,000	No	29,760,000	4,797,000
Colorado	Agriculture	NA	NA	NA	No	3,294,000	5,862,000
Connecticut	Environment	$895,600	14	$499,080	No	3,287,000	129,000
Delaware	Agriculture	$450,167	8	$182,118	Yes	666,000	496,000
Florida	Agriculture	$5,877,858	121	$2,897,300	Yes	12,938,000	1,076,000
Georgia	Agriculture	$2,502,610	35	NA	Yes	6,478,000	3,793,000
Hawaii	Agriculture	$1,100,000	25	NA	Yes	1,108,000	79,000
Idaho	Agriculture	NR	NR	NR	NR	1,007,000	4,281,000
Illinois	Agriculture	NR	NR	NR	NR	11,431,000	22,759,000
Indiana	University	NR	NR	NR	NR	5,544,000	11,485,000
Iowa	Agriculture	$1,800,000	22	$1,600,000	Yes	2,777,000	23,276,000
Kansas	Agriculture	$1,196,296	25	$236,460	Yes	2,478,000	20,978,000
Kentucky	Agriculture	NA	37	NA	No	3,685,000	5,505,000
Louisiana	Agriculture	$2,579,274	4	$2,000,000	Yes	4,220,000	4,367,000
Maine	Agriculture	$773,685	12	$510,340	Yes	1,228,000	361,000
Maryland	Agriculture	$1,317,628	25	$619,940	Yes	4,781,000	1,552,000
Massachusetts	Agriculture	NA	13	$600,000	Yes	6,016,000	135,000
Michigan	Agriculture	$2,994,300	41	$855,300	No	9,295,000	6,510,000
Minnesota	Agriculture	$2,650,000	40	$3,300,000	No	4,375,000	18,779,000
Mississippi	Agriculture	$762,053	19	$366,050	Yes	2,573,000	4,723,000
Missouri	Agriculture	$547,720	17	$148,290	No	5,117,000	12,685,000
Montana	Agriculture	$1,360,850	32	NA	No	779,000	8,926,000
Nebraska[7]	Agriculture	$85,000	2	$68,500	Yes	1,578,000	18,044,000
Nevada	Agriculture	$500,000	5	$125,000	Yes	1,202,000	520,000
New Hampshire	Agriculture	$450,000	7	$260,000	Yes	1,109,000	91,000
New Jersey	Environment	$3,000,000	45	$2,180,000	No	7,730,000	364,000
New Mexico	Agriculture	NR	NR	NR	NR	1,515,000	881,000
New York	Environment	$2,850,000	51	$1,190,000	No	17,990,000	3,538,000
North Carolina	**Agriculture**	**$4,149,424**	**79**	**$371,730**	**Yes**	**6,629,000**	**4,370,000**
North Dakota	Agriculture	$1,141,483	8	$765,000	Yes	639,000	21,229,000
Ohio	Agriculture	$1,764,000	25	$580,000	Yes	10,847,000	10,132,000
Oklahoma	Agriculture	$1,069,085	20	$420,150	Yes	3,146,000	9,688,000
Oregon	Agriculture	NA	14	NA	No	2,842,000	2,290,000
Pennsylvania	Agriculture	$1,750,000	9	$1,057,000	Yes	11,882,000	4,094,000
Rhode Island	Agriculture	$270,000	5	$300,000	Yes	1,003,000	10,000

Table 12, *continued*

State	Type of Lead Pesticide Agency[2]	Total Budget, FY 92–93	Total Budgeted Staff, FY 92–93	Total Product Registration Fees[3]	Over-sight Board?[4]	Total State Population, 1990[5]	Acres of Crops Harvested 1990[6]
South Carolina	University	$1,580,000	34	NA	Yes	3,487,000	2,049,000
South Dakota	Agriculture	$593,116	8	$304,601	No	696,000	15,552,000
Tennessee	Agriculture	$998,398	30	$285,000	No	4,877,000	4,477,000
Texas[8]	Agriculture	$2,300,000	64	$1,070,000	No	16,987,000	18,550,000
Utah	Agriculture	NA	6	NA	Yes	1,723,000	992,000
Vermont	Agriculture	$512,000	8	$239,000	Yes	563,000	441,000
Virginia	Agriculture	$1,926,158	28	$838,817	Yes	6,187,000	2,726,000
Washington	Agriculture	$2,432,106	54	$570,863	Yes	4,867,000	4,168,000
West Virginia	Agriculture	$490,000	11	$156,000	No	1,793,000	668,000
Wisconsin	Agriculture	$4,346,969	20	$3,519,475	Yes	4,892,000	8,550,000
Wyoming	Agriculture	$100,000	2	0	Yes	454,000	1,735,000
Number of States Responding	(50)	39	44	37	45	(50)	(49)
Average Among Survey Respondents	—	$2,694,724	33	$862,973	—	—	—
Total Count	Agriculture 43 Environment 5 University 2	—	—	—	Yes 27 No 18	—	—

[1] Information based on responses to the N.C. Center for Public Policy Research's survey of state pesticide programs, except populations and crop acreages, which are based on U.S. Bureau of the Census data. NR = State did not respond to survey; NA = State did not answer question on survey.

[2] States responses when asked to describe the lead agency in which their pesticide programs are located. Lead pesticide agency for the five states that did not respond to survey was determined from: R. Steven Brown and Karen Marshall, *Resource Guide to State Environmental Management, Third Edition*, The Council of State Governments, Lexington, Ky., 1993.

[3] Total receipts of pesticide product registration fees in FY 1992–93.

[4] State responses to the question: Does your state have a lead board or commission that oversees your pesticide program?

[5] Populations as reported for 1990 by the U.S. Bureau of the Census, *Statistical Abstract of the United States: 1992* (112th edition), Washington, D.C., 1992, p. 22.

[6] *Ibid.*, p. 660.

[7] At the time of the Center's survey in August 1993, Nebraska's pesticide regulation was enforced by the U.S. Environmental Protection Agency. Since then, the Nebraska legislature has authorized the state's Department of Agriculture to regulate pesticides, with an initial annual budget of $750,000.

[8] Budget and staff figures for Texas are incomplete; they do not include money for inspections and enforcement.

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staff. North Carolina has more resources than average, with a $4.1-million budget and 79 employees.

North Carolina also compares favorably when states are ranked according to the total size of their annual pesticide program budgets. (See Table 13 below.) The budget for North Carolina's pesticide program ranked fourth among the survey respondents, surpassed only by California, Florida, and Wisconsin. Other top-10 states in total budgets included New Jersey, Michigan, New York, Minnesota, Louisiana, and Georgia.

However, the top-10 rankings change considerably when annual budgets are adjusted for state populations or crop acreages. North Dakota, which spent $1.79 per person, was the top state when pesticide budgets were divided by 1990 populations. North Carolina tied with Maine for 10th place, with both states spending $0.63 per person on pesticide regulation. Other top-10 states in spending per population were: Montana, California, Hawaii, Vermont, Wisconsin, South Dakota, Delaware, and Iowa.

Not surprisingly, smaller states dominated the top-10 list when annual budgets were adjusted for crop acreages. Rhode Island, which spent $27 per acre, ranked first—followed by Hawaii, California, New Jersey, Connecticut, Florida, New Hampshire, Maine, Arizona, and Vermont. North Carolina, which spent $0.95 per acre, placed 12th among the survey respondents. California and North Carolina were the only two states to rank highly in total spending as well as spending adjusted for population and crop acreage.

States generally support their pesticide programs with funds from legislative allocations, federal grants, and pesticide-product registration

Table 13.
Leading State Pesticide Programs in Total Budgets, FY 1992–93

State	Total Budget, FY 1992-93	(Rank)[1]	Total Spending Adjusted for State Population	(Rank)[2]	Total Spending Adjusted for Crop Acreage	(Rank)[3]
California	$44,050,000	(1)	$1.48	(3)	$9.18	(3)
Florida	$5,877,858	(2)	$0.45	(17)	$5.46	(6)
Wisconsin	$4,346,969	(3)	$0.89	(6)	$0.51	(22)
North Carolina	**$4,149,424**	**(4)**	**$0.63**	**(10) tie**	**$0.95**	**(12)**
New Jersey	$3,000,000	(5)	$0.39	(22)	$8.24	(4)
Michigan	$2,994,300	(6)	$0.32	(25)	$0.46	(23)
New York	$2,850,300	(7)	$0.16	(35)	$0.81	(15)
Minnesota	$2,650,000	(8)	$0.61	(13)	$0.14	(29)
Louisiana	$2,579,274	(9)	$0.61	(12)	$0.59	(20)
Georgia	$2,502,610	(10)	$0.39	(23)	$0.66	(19)

[1] Information based on responses to the N.C. Center for Public Policy Research's survey of state pesticide programs. Rankings among 39 states that responded to this survey question.

[2] Total budget divided by state population as reported by the 1990 U.S. Census. Other top 10 states in spending by population were: North Dakota, $1.79 (1); Montana, $1.75 (2); Hawaii, $0.99 (4); Vermont, $0.91 (5); South Dakota, $0.85 (7); Delaware, $0.68 (8); Iowa, $0.65 (9); and Maine, $0.63 (10) tie.

[3] Total budget divided by statewide acres of harvested crops in 1990 as reported by the U.S. Bureau of the Census, *Statistical Abstract of the United States: 1992* (112th edition), Washington, D.C., 1992, p. 660. Other top 10 states in spending by crop acreage were: Rhode Island, $27.00 (1); Hawaii, $13.92 (2); Connecticut, $6.94 (5); New Hampshire, $4.95 (7); Maine, $2.14 (8); Arizona, $2.02 (9); and Vermont, $1.16 (10).

fees. The survey found that many states are collecting much more money from registration fees than North Carolina does. (See Table 14 on right.) Despite the size of its total budget, North Carolina collected only $371,730 in registration fees in FY 1992–93, ranking 22nd among the 37 states that answered that question. By comparison, the average state collected $862,973 in registration fees. Top-ranked Wisconsin—with nearly the same total annual budget as North Carolina—collected more than $3.5 million in registration fees. However, North Carolina's collections should increase substantially in FY 1993–94, as the General Assembly more than doubled the state's product registration fees, effective July 1, 1993.[6]

Table 14.
Leading States in Total Pesticide Product Registration Fees Collected in Fiscal Year 1992–93

Rank[1]	State	Total Fees
1	Wisconsin	$3,519,475
2	Minnesota	$3,300,000
3	Florida	$2,897,300
4	New Jersey	$2,180,000
5	California	$2,054,000
6	Louisiana	$2,000,000
7	New York	$1,900,000
8	Iowa	$1,600,000
9	Texas	$1,070,000
10	Pennsylvania	$1,057,000
22	**North Carolina**	**$371,730**
AVERAGE (37 States)		$862,973

[1] Rank among 37 states that responded to question in the N.C. Center for Public Policy Research's survey of 50 states.

Pesticide Programs Vary in Administration and Responsibilities

One of the goals of the Center's survey was to characterize the "lead" pesticide agency in each state—that is, the primary agency authorized by the U.S. Environmental Protection Agency to enforce pesticide regulations. In North Carolina, the pesticide program is administered through the Department of Agriculture—and most states have similar setups. (See Table 12 on pp. 64–65 and Table 15 on p. 69.)

The Center's research found that, among the 50 state pesticide programs, 43 (86 percent) are located in agricultural agencies, five (10 percent) are located in environmental or natural resources agencies, and two (4 percent) are located in public universities. (The five states that did not respond to the survey were assigned to categories based on the names and addresses of their lead pesticide programs.) The regulation of pesticides by agricultural agencies has raised questions about potential conflicts of interests in North Carolina and other states.

"If nothing else, it's a perceptual problem—of the fox guarding the chicken house," says Mary Joan Pugh, a former member of the N.C. Pesticide Board. "They're trying to help farmers and at the same time make sure that the regulations are enforced. That's a very hard balance to strike." (The implications of agricultural agencies regulating pesticide use are discussed in more detail, starting on p. 83.)

The Center's survey also looked at the regulatory responsibilities of state pesticide programs, finding that most have a broad range of duties. (See Table 15 on p. 69 and Table 16 on pp. 72–73.) Virtually every state program is involved in: registration of pesticide products; regulation of pesticide use; structural pest control; adoption of regulations; and worker protection. More than half of the programs are involved in: education and training of pesticide users; quality control testing of products; pesticide disposal; monitoring of pollution and spills; and testing for pesticide residues in food. North Carolina is one of about 15 states (one-third of the respondents) with responsibilities in all of these areas.

Like North Carolina, a majority of the states surveyed (60 percent) have boards or commissions that oversee their pesticide programs. (See Table 12 on pp. 64–65 and Table 17 on p. 75.) However, few states have oversight boards with as many responsibilities and powers as in North Carolina. In many states, the oversight boards primarily serve as advisory panels to the pesticide programs. The make-up of these pesticide boards varies widely. More than half of the boards

contain members representing farmers, universities, public health, agricultural agencies, environmental groups, and state environmental agencies. Most of the boards do not have members representing the chemical industry, consumer groups, and farmworkers. (For a detailed discussion of the make-up of North Carolina's pesticide oversight boards, see pp. 35–41 of the article, "Enforcement of Pesticide Regulations in North Carolina."[7])

Programs Dealing With Environmental Problems

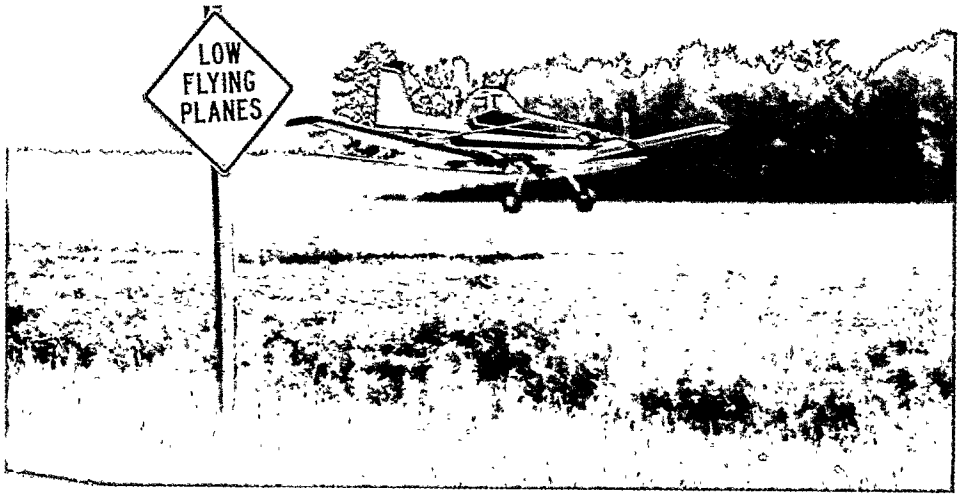
Most states have programs dealing with specific environmental problems, such as groundwater contamination by pesticides. (See Table 18 on p. 76.) More than 90 percent of the states (including North Carolina) have programs for testing or monitoring groundwater—and most of those programs have detected pesticides in wells in their state.

Virtually all of the states surveyed (including North Carolina) also have established procedures for the public to report pesticide spills, accidents, or abuses. More than half of the states (including North Carolina) have programs for handling the disposal of unwanted pesticides and have banned or restricted the use of specific pesticides beyond federal requirements.

North Carolina is among 21 states (47 percent of the respondents) that restrict aerial applications of pesticides beyond the minimum requirements on product labels. For instance, North Carolina is among 16 states (36 percent of the respondents) that limit aerial deposits or drift within specified buffer zones around target sites. In addition, aerial applicators and industry representatives say that North Carolina is one of the few states that expressly prohibit *any* deposit or drift of pesticides in such buffer zones. "That is a really, really rigid standard," says Robert Fugitt, governmental affairs manager for DuPont chemical company in Wilmington, Del. "North Carolina has such a strict drift policy that it's very easy for a pilot to make a good application and still end up being cited for a violation."

However, North Carolina does not require pilots to notify nearby residents before spraying pesticides[8]—a measure required by one-third of the states. Aerial applicators generally oppose notification requirements because of potential delays and difficulties in tracking down nearby residents. "I can't go around and knock on everybody's house," says Wayne Slaughter, a Farmville pilot and past president of the N.C. Agricultural Aviation Association. "That would be economically impossible, and it would also prevent me from being on time. . . . A lot of my

North Carolina, like two-thirds of the states the Center surveyed, does not require aerial applicators to notify nearby residents before spraying pesticides on fields.



Karen Tam

Table 15.
Highlights of State Pesticide Programs

Question (Number of States Responding)[1]	All States (Percent Yes)	North Carolina
What category best describes the lead agency in which your pesticide program is located?[3] (50)		
Agriculture	86%	A,[2] B
Environment or Natural Resources	10%	
Public University	4%	
What areas of pesticide policy does your agency deal with? (45)		
Sales, distribution, and registration	100%	A
Pesticide application and use	98%	A, B
Adopting or revising regulations	98%	A, B
Structural pest control	93%	B
Worker protection	93%	A
Educating and training users	82%	A, B
Quality control testing of pesticide products	71%	A
Pesticide disposal	69%	A, B
Monitoring pesticide pollution and spills	64%	A, B
Testing for pesticide residues in food	51%	A
What regulatory powers does your agency have in dealing with those who violate pesticide regulations? (45)		
Suspending or revoking licenses	98%	A, B
Sending warning letters	98%	A, B
Levying fines or penalties	93%	A, B
Initiating criminal prosecutions	67%	A, B
Requiring cleanups	49%	A

[1] Number of states that answered this question in the N.C. Center for Public Policy Research's survey of state pesticide programs.

[2] Responses to survey questions by North Carolina's pesticide program. North Carolina's program is administered by two different agencies in the Department of Agriculture: A) the Pesticide Section of the Food and Drug Protection Division, which primarily regulates agricultural uses of pesticides, and B) the Structural Pest Control Division, which regulates exterminators.

[3] Type of lead agency for the five states that did not respond to the survey (Arkansas, Idaho, Illinois, Indiana, and New Mexico) was determined from R. Steven Brown and Karen Marshall, *Resource Guide to State Environmental Management, Third Edition*, The Council of State Governments, Lexington, Ky., 1993.

work comes in the day we do it—because that's the time it needs to be done. If we wait another day, these [insect] eggs will hatch."

Some states, like Connecticut, require aerial applicators to notify all nearby residents before any spraying. But most state notification requirements are not that stringent, instead requiring applicators to run newspaper ads before conducting large-scale spraying. Massachusetts takes a common-sense approach: it requires the posting of warning signs on application sites prior to spraying—a measure that officials say has substantially reduced complaints from nearby residents. "Any aerial spraying requires a sign," says Gail Kaprielian of the Massachusetts Pesticide Bureau. "[But] we're not telling farmers to go out and knock on everybody's doors."

Non-Agricultural Pesticide Users Prompt Most Complaints

Despite the prevalence of agricultural agencies in pesticide regulation, the Center's survey found that non-agricultural uses prompted many of the complaints about pesticide misuse. (See Table 19 on p. 77.) In fact, exterminators topped the list when pesticide administrators were asked to list the three categories of pesticide users that accounted for the most complaints in their states.

The top five user-groups in complaints generated were: exterminators (named by 76 percent of the survey respondents in 41 states), commercial applicators (61 percent), aerial applicators (46 percent), lawn care applicators (46 percent), and farmers (46 percent). Pesticide administrators reported few complaints regarding home gardeners, private utilities, producers and manufacturers, dealers, and public applicators.

The number of complaints prompted by non-agricultural users is not surprising given the large number of exterminators and lawn-care applicators that treat household and garden pests. Such users also are much more likely to apply pesticides in highly populated, urban areas than most agricultural applicators. "In our state, [violations] are heavily weighted toward the structural and non-agricultural types of applications," says John Orrok, enforcement chief in the New Jersey Pesticide Control Program. "I'm sure that more than 80 percent of our violations are non-agriculturally related."

North Carolina a Leader in Regulatory Powers and Fines

North Carolina is among those states that have the broadest range of powers for enforcing their pesticide regulations. (See Table 15 on p. 69 and Table 20 on pp. 78–79.) Virtually all of the states surveyed have the authority to send warning letters, suspend or revoke licenses, and assess fines and civil penalties. Two-thirds of the states can initiate criminal prosecutions of pesticide violators, and half of the states can require cleanups for spills and disposal problems. But only one-third of the states, including North Carolina, possess all of these powers.

A majority of states surveyed, however, can assess higher fines than North Carolina. Pesticide applicators in North Carolina can be fined as much as $2,000 per violation, except for private applicators, who can be fined up to $500 per violation. More than half the states surveyed (60 percent) can assess fines of $2,500 or more. Virginia has the authority to levy the highest fines—up to $120,000 per violation—and 10 other states reported maximum fines of $10,000 or more. Alaska reported that it could not assess fines, while Iowa, Nebraska, and Nevada have only recently acquired that authority.

The Center also asked pesticide administrators to report various measures of regulatory activity over a three-year span, 1990–92. (See Table 21 on pp. 80–81.) Three-fourths of the states (37) provided information on the amounts of fines they actually assessed and the numbers of licenses they suspended or revoked. Four-fifths of the states (40) provided information on the numbers of complaints they investigated.

Among the survey respondents, the average state fined 53 violators per year, totaling $44,998 annually. North Carolina was considerably higher than average, citing 101

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DuPont Co., Wilmington, Del.

violators per year with fines totaling $60,658 annually. California fined the most number of violators, 881 per year, while New York assessed the most in total fines, $416,943 per year. North Carolina ranked seventh in the total amount of fines assessed per year. (See Table 22 on p. 83.) However, the state's ranking drops to 13th when adjusted for population, and 12th when adjusted for crop acreage.

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>
> —Gail Kaprielian
> Massachusetts Pesticide Bureau

Other top-10 states in total fines assessed per year included: California, Louisiana, Connecticut, New Jersey, Massachusetts, Tennessee, North Dakota, and Oklahoma. As with the budget rankings, the top-10 states change considerably when total fines are adjusted for populations and crop acreages. For instance, North Dakota ranked ninth in total fines, first in fines adjusted for population, and 24th in fines adjusted for crop acreage.

Despite the relatively large amount of total fines assessed in North Carolina, the *average amount per violator* was only $601—considerably lower than the average among all state respondents, $3,434. In two states, Connecticut and Massachusetts, the average fine was more than $40,000 per violator. Pesticide administrators in both states said their average fines were inflated by large penalties assessed against a few major violators. "We don't try to get money out of people until we file civil or criminal complaints," says Gail Kaprielian of the Massachusetts Pesticide Bureau. "So, when we get to the point of getting money out of people, it's for some really nasty stuff."

Suspensions and Revocations Little Used as Regulatory Tools

Although virtually all of the state pesticide programs (98 percent) can suspend or revoke applicator licenses and certifications, the Center's survey found that most states make little use of that authority. On average, the states suspended and revoked fewer than six licenses per year—and only seven states exceeded that average. In fact, more than half of the states surveyed (58 percent) suspended and revoked fewer than two licenses or certifications per year.

Pesticide administrators acknowledge that they try to use suspensions and revocations only as a last resort. "We're not the Gestapo," says John L. Smith, North Carolina's pesticide administrator. "In a lot of cases, if you take away that license, they're out of business completely." Even some states that assess large amounts of fines say they try to reserve suspensions only for serious, flagrant, and repeat violations. "It's very difficult to get to that point, to actually suspend or revoke a license," says Carmen Valentin of the New Jersey Pesticide Control Program. "We don't usually go that route unless people are really bad actors. We usually try to fine them first."

California led the states in the number of license suspensions and revocations, averaging 96 per year from 1990–92. (See Table 23 on p. 84.) North Carolina also was among the leading states, tying for fifth place with nearly 11 suspensions and revocations per year. Other top-10 states in total suspensions and revocations were: South Carolina, Washington, Colorado, Iowa, Texas, Mississippi, Connecticut, and Michigan. North Carolina drops to ninth place when the number of suspensions and revocations are adjusted for population and crop acreage. South Carolina ranks first when the numbers are adjusted for populations, and Connecticut ranks first when the numbers are adjusted for crop acreages.

Another way to gauge the level of regulatory activity in states is to look at the number of complaints investigated. On average, state pesticide programs investigated 290 complaints per year from 1990–92. California led the states in that regard, conducting 3,656 investigations per year. (See Table 24 on p. 89.) North Carolina placed second, investigating 927 complaints per year—more than three times higher than the average. Other top-10 states in investigations were: Oklahoma, New Jersey, Washington, Texas, Florida, Oregon, Ohio, and Michigan.

As with other measures of regulatory activity, the rankings change considerably when the numbers of investigations are adjusted for populations and crop acreages. Oklahoma placed first

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Table 16.
Regulatory Responsibilities of Lead Pesticide Programs by State[1]

State	Sales, Distribution, Registration	Regulating Pesticide Use	Adopting Regulations	Structural Pest Control	Worker Protection
Alabama	Yes	Yes	Yes	Yes	Yes
Alaska	Yes	Yes	Yes	Yes	Yes
Arizona	Yes	Yes	Yes	No	Yes
Arkansas	NR	NR	NR	NR	NR
California	Yes	Yes	Yes	Yes	Yes
Colorado	Yes	Yes	Yes	Yes	No
Connecticut	Yes	Yes	Yes	Yes	Yes
Delaware	Yes	Yes	Yes	Yes	Yes
Florida	Yes	Yes	Yes	Yes	Yes
Georgia	Yes	Yes	Yes	Yes	Yes
Hawaii	Yes	Yes	Yes	Yes	Yes
Idaho	NR	NR	NR	NR	NR
Illinois	NR	NR	NR	NR	NR
Indiana	NR	NR	NR	NR	NR
Iowa	Yes	Yes	Yes	Yes	Yes
Kansas	Yes	Yes	Yes	Yes	Yes
Kentucky	Yes	Yes	Yes	Yes	Yes
Louisiana	Yes	Yes	Yes	Yes	Yes
Maine	Yes	Yes	Yes	Yes	Yes
Maryland	Yes	Yes	Yes	Yes	Yes
Massachusetts	Yes	Yes	Yes	Yes	Yes
Michigan	Yes	Yes	Yes	Yes	Yes
Minnesota	Yes	Yes	Yes	Yes	Yes
Mississippi	Yes	Yes	Yes	Yes	Yes
Missouri	Yes	Yes	Yes	Yes	Yes
Montana	Yes	Yes	Yes	Yes	Yes
Nebraska[2]	Yes	No	No	No	No
Nevada	Yes	Yes	Yes	Yes	Yes
New Hampshire	Yes	Yes	Yes	Yes	Yes
New Jersey	Yes	Yes	Yes	Yes	Yes
New Mexico	NR	NR	NR	NR	NR
New York	Yes	Yes	Yes	Yes	Yes
North Carolina	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
North Dakota	Yes	Yes	Yes	Yes	Yes
Ohio	Yes	Yes	Yes	Yes	Yes
Oklahoma	Yes	Yes	Yes	Yes	Yes
Oregon	Yes	Yes	Yes	Yes	No
Pennsylvania	Yes	Yes	Yes	Yes	Yes
Rhode Island	Yes	Yes	Yes	Yes	Yes
South Carolina	Yes	Yes	Yes	Yes	Yes
South Dakota	Yes	Yes	Yes	Yes	Yes
Tennessee	Yes	Yes	Yes	Yes	Yes
Texas	Yes	Yes	Yes	No	Yes
Utah	Yes	Yes	Yes	Yes	Yes
Vermont	Yes	Yes	Yes	Yes	Yes
Virginia	Yes	Yes	Yes	Yes	Yes
Washington	Yes	Yes	Yes	Yes	Yes
West Virginia	Yes	Yes	Yes	Yes	Yes
Wisconsin	Yes	Yes	Yes	Yes	Yes
Wyoming	Yes	Yes	Yes	Yes	Yes
Percent "Yes" Among Survey Respondents	100%	98%	98%	93%	93%

[1] Information based on the N.C. Center for Public Policy Research's survey of state pesticide programs. Table based on responses from 45 states that answered the survey question: What areas of pesticide policy does your agency deal with? NR = State did not respond to survey.

Table 16, *continued*

Educating, Training Users	Quality Control Testing	Pesticide Disposal	Monitoring Pollution and Spills	Testing Food for for Pesticide Residues	State
Yes	Yes	Yes	Yes	Yes	Alabama
Yes	No	Yes	No	No	Alaska
Yes	Yes	No	No	No	Arizona
NR	NR	NR	NR	NR	Arkansas
Yes	Yes	Yes	Yes	Yes	California
No	Yes	No	No	No	Colorado
No	Yes	No	No	No	Connecticut
Yes	Yes	Yes	Yes	Yes	Delaware
Yes	Yes	Yes	Yes	Yes	Florida
No	Yes	Yes	No	Yes	Georgia
Yes	Yes	Yes	Yes	No	Hawaii
NR	NR	NR	NR	NR	Idaho
NR	NR	NR	NR	NR	Illinois
NR	NR	NR	NR	NR	Indiana
Yes	Yes	Yes	Yes	No	Iowa
Yes	No	No	No	No	Kansas
No	No	No	No	No	Kentucky
Yes	Yes	Yes	Yes	Yes	Louisiana
Yes	No	No	Yes	No	Maine
Yes	Yes	Yes	Yes	Yes	Maryland
Yes	No	No	No	No	Massachusetts
No	Yes	Yes	Yes	Yes	Michigan
Yes	Yes	Yes	Yes	Yes	Minnesota
Yes	Yes	Yes	Yes	No	Mississippi
Yes	No	No	No	No	Missouri
Yes	Yes	Yes	Yes	Yes	Montana
No	Yes	No	No	No	Nebraska[2]
Yes	Yes	Yes	Yes	Yes	Nevada
Yes	No	No	No	No	New Hampshire
Yes	No	Yes	Yes	No	New Jersey
NR	NR	NR	NR	NR	New Mexico
Yes	Yes	Yes	Yes	No	New York
Yes	**Yes**	**Yes**	**Yes**	**Yes**	**North Carolina**
Yes	No	Yes	Yes	No	North Dakota
Yes	Yes	Yes	Yes	Yes	Ohio
Yes	Yes	Yes	Yes	Yes	Oklahoma
Yes	No	No	No	No	Oregon
Yes	No	Yes	Yes	Yes	Pennsylvania
No	No	No	Yes	No	Rhode Island
Yes	Yes	No	Yes	No	South Carolina
Yes	Yes	Yes	Yes	Yes	South Dakota
No	Yes	No	Yes	Yes	Tennessee
Yes	Yes	Yes	No	Yes	Texas
Yes	No	Yes	No	No	Utah
Yes	Yes	Yes	Yes	Yes	Vermont
Yes	Yes	Yes	Yes	Yes	Virginia
Yes	Yes	Yes	No	Yes	Washington
Yes	Yes	Yes	Yes	Yes	West Virginia
Yes	Yes	Yes	Yes	Yes	Wisconsin
Yes	Yes	Yes	No	No	Wyoming
82%	71%	69%	64%	51%	**Percent "Yes" Among Survey Respondents**

[2] When the N.C. Center conducted its survey in August 1993, Nebraska's pesticide regulation was enforced by the U.S. Environmental Protection Agency. Since then, the Nebraska legislature has authorized its Department of Agriculture to assume enforcement responsibilities. Thus, the state now has responsibility for regulating pesticide use, adopting regulations, and overseeing structural pest control and worker protection.

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in investigations per 1 million people, and Connecticut placed first in the number of investigations per 1 million acres of crops. North Carolina ranked third in investigations adjusted for population, and ninth when adjusted for crop acreages.

Training Programs Hard to Compare

The Center's survey also gathered information on pesticide education and training programs, which may be the most effective way to prevent the misuse of chemicals. (See Table 25 on p. 90.) North Carolina and most other states (84 percent) report that their licensing and certification requirements exceed the minimum federal standards. Virtually all of the states (98 percent) require applicators to pass written examinations demonstrating their knowledge of pesticide safety and use in order to obtain or renew their licenses and certifications. And, almost all states (98 percent) handle training programs through or in coordination with their cooperative extension services.

Educational requirements are hard to compare in more detail because the states categorize pesticide applicators so differently. For example, commercial applicators in some states include everything from aerial applicators to exterminators to lawn service firms. Other states, like North Carolina, have specific categories for many different types of applicators. States also vary widely

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Betsy Small harvests cherry tomatoes at an organic farm in Chatham County.

Tom Mather

Table 17.
Oversight Boards for State Pesticide Programs

Question (Number of States Responding)[1]	**All States (Percent Yes)**[2]	**North Carolina**
Does the state have a board or commission that oversees its pesticide program? (45)	60%	A,[3] B
If the state has an oversight board, which of the following areas is it involved in? (27)		
Advising staff	81%	A, B
Adopting or revising regulations	67%	A, B
Setting policy	59%	A
Hearing contested cases and appeals	37%	A, B
Issuing or suspending licenses and permits	30%	A, B
Enforcing regulations	22%	A, B
Fining violators	22%	A, B
Allocating funds	15%	A
Which of the following groups are represented on state's oversight board? (25)		
Universities or colleges	72%	B
Farmers	68%	A
Agriculture industry	64%	A
Public health	64%	A, B
State agriculture agency	64%	A, B
Environmental or conservation groups	64%	A[4]
State environment, natural resources agency	60%	A
Chemical industry	44%	A
Consumer groups	12%	B
Farmworkers	8%	—
Other	64%	B

[1] Number of states that answered this question in the N.C. Center for Public Policy Research's survey of state pesticide programs.

[2] Percentage of "yes" responses among states that answered this survey question.

[3] Responses of "yes" to survey questions from North Carolina's pesticide program. Responses pertain to two panels: A) the N.C. Pesticide Board, which primarily regulates agricultural uses, and B) the N.C. Structural Pest Committee, which regulates exterminators. Responses do not include the N.C. Pesticide Advisory Committee, which advises the Pesticide Board on technical matters but has no regulatory authority.

[4] The N.C. Pesticide Law states that the Pesticide Board should contain a "non-governmental conservationist," but no member of the current board meets that qualification.

Table 18.
Summary of State Environmental Programs Dealing With Pesticides

Question (Number of States Responding)[1]	**All States (Percent Yes)**	**North Carolina**[2]
Does the state have a program for monitoring or testing groundwater for pesticide contamination? (45)	91%	Yes
Has that testing program detected any pesticides in your state's groundwater? (39)	90%	Yes
Has the state banned or restricted the use of any pesticides beyond federal requirements? (45)	60%	Yes
Does the state have procedures for the public to report pesticide spills, accidents, or abuses? (45)	91%	Yes
Does the state have a program for handling the disposal of outdated or unneeded pesticides? (45)	58%[3]	Yes
Does the state restrict aerial applicators of pesticides beyond the minimum requirements on product labels? (45)	47%	Yes
Does the state require pilots to notify people owning land or living near application sites before spraying pesticides? (45)	33%[4]	No[5]

[1] Number of states that answered this question in the N.C. Center for Public Policy Research's survey of state pesticide programs.

[2] Responses of "yes" to survey questions from the N.C. Department of Agriculture.

[3] Two states that answered "No" said they were developing pesticide disposal programs.

[4] Seven states that "sometimes" require notification are included with the states that answered "Yes" to this question.

[5] North Carolina requires notification in two limited circumstances: those seeking to spray in restricted areas, and those spraying within $^1/_2$-mile of registered apiaries (bee colonies).

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in how often applicators must renew their certifications.

Nevertheless, the Center's survey of pesticide programs found that many states have more extensive educational requirements than North Carolina—particularly with regard to the hours of training that applicators need to renew their certifications. For example, the state of Washington requires all applicators to complete 40 hours of training every five years to renew their licenses or certifications. Colorado's requirements range from 36 hours for commercial applicators to 160 hours for exterminators, with a three-year renewal cycle. North Carolina has different training requirements for more than a dozen types of applicators, ranging from four hours every two years for aerial applicators to 10 hours every five years for horticultural applicators.

"Recertification [in North Carolina] is a total joke—it's like one evening every three years" for most private applicators, says Allen Spalt of the Agricultural Resources Center. Even some commercial applicators say that North Carolina should increase its training requirements for recertifica-

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Table 19.
Leading Causes of Complaints to State Pesticide Agencies

Types of Pesticide Users	Number of State Programs that Cited User Group as a Leading Cause of Complaints[1]	Percent of Survey Respondents[2]	Weighted Score[3]
Exterminators	31	76%	72
Commercial applicators	25	61%	55
Aerial applicators (Crop dusters)	19	46%	40
Lawn care applicators	19	46%	37
Farmers	19	46%	31
Home gardeners	3	7%	6
Private utilities	3	7%	4
Producers, manufacturers	1	5%	2
Pesticide dealers	1	5%	1
Public operators	1	5%	1
Other	1	5%	2

[1] Information based on the N.C. Center for Public Policy Research's survey of state pesticide programs. The survey question asked pesticide administrators to indicate the three categories of pesticide users that prompted the most complaints about pesticide use in their states.

[2] Percent of the 41 states that answered this survey question.

[3] Pesticide user groups received 3 points for every survey in which they were ranked as the leading source of complaints, 2 points when ranked second, and 1 point when ranked third. The N.C. Pesticide Section, which primarily regulates agricultural uses, ranked problem users as follows: 1) commercial applicators, 2) farmers, 3) aerial applicators. The N.C. Structural Pest Control Division, which regulates exterminators, ranked problem users as follows: 1) exterminators, and 2) commercial applicators.

Table 20.
Regulatory Powers of Lead Pesticide Programs by State[1]

State	Suspend, Revoke Licenses	Send Warning Letters	Assess Fines, Civil Penalties	Initiate Criminal Prosecutions	Require Cleanups	Maximum Fine	Can Assess Higher Fines on Repeat Offenders
Alabama	Yes	Yes	Yes	No	No	$10,000	Yes
Alaska	Yes	Yes	No	Yes	Yes	0	NA
Arizona	Yes	Yes	Yes	No	No	$10,000	Yes
Arkansas	NR	NR	NR	NR	NR	NR	NR
California	Yes	Yes	Yes	Yes	No	$50,000	Yes
Colorado	Yes	Yes	Yes	No	Yes	$1,000	No
Connecticut	Yes	Yes	Yes	Yes	Yes	$5,000/day	No
Delaware	Yes	Yes	Yes	Yes	Yes	$2,500	Yes
Florida	Yes	Yes	Yes	No	No	$10,000	Yes
Georgia	Yes	Yes	Yes	No	Yes	NA	Yes
Hawaii	Yes	Yes	Yes	No	No	$5,000	Yes
Idaho	NR	NR	NR	NR	NR	NR	NR
Illinois	NR	NR	NR	NR	NR	NR	NR
Indiana	NR	NR	NR	NR	NR	NR	NR
Iowa	Yes	Yes	Yes	Yes	No	$500	No
Kansas	Yes	Yes	Yes	Yes	No	$5,000	No
Kentucky	Yes	Yes	Yes	Yes	No	NA	NA
Louisiana	Yes	Yes	Yes	No	Yes	$5,000	Yes
Maine	Yes	Yes	Yes	Yes	Yes	$4,000	Yes
Maryland	Yes	Yes	Yes	Yes	No	$5,000	Yes
Massachusetts	Yes	Yes	Yes	Yes	Yes	$25,000	No
Michigan	Yes	Yes	Yes	Yes	No	$25,000	No
Minnesota	Yes	Yes	Yes	Yes	Yes	NA	Yes
Mississippi	Yes	Yes	Yes	Yes	No	$25,000	Yes
Missouri	Yes	Yes	Yes	Yes	No	$1,000	Yes
Montana	Yes	Yes	Yes	No	Yes	$1,000	No
Nebraska[2]	No	No	No	No	No	0	NA
Nevada[3]	Yes	Yes	Yes	No	Yes	$5,000	Yes
New Hampshire	Yes	Yes	Yes	No	No	$1,000	Yes
New Jersey	Yes	Yes	Yes	Yes	Yes	$3,000	Yes
New Mexico	NR	NR	NR	NR	NR	NR	NR
New York	Yes	Yes	Yes	Yes	Yes	$10,000	Yes
North Carolina	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**$2,000**	**Yes**

Table 20, *continued*

State	Suspend, Revoke Licenses	Send Warning Letters	Assess Fines, Civil Penalties	Initiate Criminal Prosecutions	Require Cleanups	Maximum Fine	Can Assess Higher Fines on Repeat Offenders
North Dakota	Yes	Yes	Yes	No	Yes	$5,000	No
Ohio	Yes	Yes	Yes	Yes	Yes	$5,000	Yes
Oklahoma	Yes	Yes	Yes	Yes	Yes	$1,000	No
Oregon	Yes	Yes	Yes	Yes	Yes	$2,000	Yes
Pennsylvania	Yes	Yes	Yes	Yes	No	$10,000	Yes
Rhode Island	Yes	Yes	Yes	No	No	$10,000	Yes
South Carolina	Yes	Yes	Yes	Yes	No	$1,000	Yes
South Dakota	Yes	Yes	Yes	Yes	Yes	$5,000	No
Tennessee	Yes	Yes	Yes	Yes	Yes	$1,000	Yes
Texas	Yes	Yes	Yes	Yes	No	$2,000	Yes
Utah	Yes	Yes	Yes	No	No	NA	NA
Vermont	Yes	Yes	Yes	Yes	Yes	$1,000	No
Virginia	Yes	Yes	Yes	Yes	No	$120,000	Yes
Washington	Yes	Yes	Yes	No	No	$7,500	Yes
West Virginia	Yes	Yes	Yes	Yes	No	$1,000	Yes
Wisconsin	Yes	Yes	Yes	Yes	Yes	NA	Yes
Wyoming	Yes	Yes	No	Yes	No	$1,000	Yes
Number of States Responding	45	45	45	45	45	40	41.
Percent "Yes" Among Survey Responses	98%	98%	93%	67%	49%	—	71%

[1] Information based on the N.C. Center for Public Policy Research's survey of state pesticide programs. Table summarizes responses from 45 states to the following survey questions: (a) What authority does your agency have in dealing with those who violate pesticide regulations? (b) What is your maximum fine per violation? (c) Do you have the authority to levy higher fines on repeat violators? NR = State did not respond to survey; NA = State did not answer question on survey.

[2] When the Center conducted its survey in August 1993, Nebraska's pesticide regulation was enforced by the U.S. Environmental Protection Agency. Since then, the Nebraska legislature has authorized its Department of Agriculture to assume enforcement responsibilities. Therefore, the state now has authority to suspend and revoke licenses, send warning letters, assess fines and civil penalties, and initiate criminal prosecutions. Also, the state's maximum fine is now $15,000, but it cannot assess higher fines on repeat offenders.

[3] Nevada's pesticide program did not have the authority to assess fines until Oct. 1, 1993.

Table 21.
Fines, Suspensions, and Investigations by State Pesticide Programs, 1990–92[1]

State	Total Dollars in Fines Levied Per Year	(Rank)	Number of Fines Levied Per Year	Average Amount Per Fine	Licenses Suspended, Revoked Per Year	(Rank)	Complaints Investigated Per Year	(Rank)
Alabama	NA		NA	NA	0	(32 tie)	155.3	(18)
Alaska	0	(34 tie)	0	0	0	(32 tie)	7.7	(38)
Arizona	$6,596	(24)	61.7	$109	0.7	(21 tie)	171.3	(16)
Arkansas	NR		NR	NR	NR		NR	
California[2]	$387,300	(2)	881.0	$440	96.0	(1)	3,656.0	(1)
Colorado	$24,867	(12)	NA	NA	15.3	(4)	56.0	(34)
Connecticut	$116,417	(4)	2.7	$43,656	4.3	(9)	232.7	(15)
Delaware	$5,607	(26)	5.7	$989	0.7	(21 tie)	27.0	(37)
Florida[2,3]	$23,163	(14)	8.5	$2,725	0.3	(24 tie)	416.0	(7)
Georgia[3]	NA		1.0	NA	0	(32 tie)	83.0	(31)
Hawaii	$11,650	(20)	21.7	$538	0.3	(24 tie)	88.7	(29)
Idaho	NR		NR	NR	NR		NR	
Illinois	NR		NR	NR	NR		NR	
Indiana	NR		NR	NR	NR		NR	
Iowa[4]	0	(34 tie)	0	0	10.7	(5 tie)	143.3	(20)
Kansas	$7,667	(22)	12.7	$605	1.3	(16 tie)	136.7	(21)
Kentucky	NA		NA	NA	NA		NA	
Louisiana[3]	$153,833	(3)	23.0	$6,688	0.7	(21 tie)	263.7	(12)
Maine	$12,586	(19)	58.0	$217	0	(32 tie)	67.0	(32)
Maryland	$6,725	(23)	45.0	$149	2.0	(13 tie)	159.3	(17)
Massachusetts	$61,733	(6)	1.3	$46,300	2.7	(11)	61.0	(33)
Michigan	$1,450	(31)	3.7	$395	3.0	(10)	305.3	(10)
Minnesota	NA		NA	NA	0.3	(24 tie)	100.0	(28)
Mississippi	$6,500	(25)	7.7	$848	4.7	(8)	245.0	(13)
Missouri	$4,825	(27)	3.0	$1,608	0	(32 tie)	125.0	(23)
Montana	$3,350	(28)	18.0	$186	1.7	(15)	83.3	(30)
Nebraska[4]	0	(34 tie)	0	0	NA		NA	
Nevada[4]	0	(34 tie)	0	0	1.0	(18 tie)	NA	
New Hampshire	NA		NA	NA	NA		NA	
New Jersey	$106,479	(5)	172.0	$619	1.0	(18 tie)	503.0	(4)
New Mexico	NR		NR	NR	NR		NR	
New York	$416,943	(1)	93.0	$4,483	1.0	(18 tie)	147.7	(19)

Table 21, *continued*

State	Total Dollars in Fines Levied Per Year	(Rank)	Number of Fines Levied Per Year	Average Amount Per Fine	Licenses Suspended, Revoked Per Year	(Rank)	Complaints Investigated Per Year	(Rank)
North Carolina	**$60,658**	**(7)**	**101.0**	**$601**	**10.7**	**(5 tie)**	**927.0**	**(2)**
North Dakota	$35,528	(9)	79.7	$446	0.3	(24 tie)	51.0	(35)
Ohio	NA		NA	NA	NA		325.3	(9)
Oklahoma	$27,250	(10)	14.7	$1,858	0	(32 tie)	576.3	(3)
Oregon[2]	$22,000	(15)	28.0	$688	0.3	(24 tie)	345.7	(8)
Pennsylvania	$13,800	(18)	29.3	$470	0	(32 tie)	122.0	(25)
Rhode Island	$2,333	(30)	0.7	$3,500	0	(32 tie)	7.3	(39)
South Carolina	$26,490	(11)	60.0	$441	25.3	(2)	296.7	(11)
South Dakota	$11,324	(21)	36.3	$312	2.0	(13 tie)	105.0	(27)
Tennessee	$52,500	(8)	68.0	$772	2.3	(12)	132.7	(22)
Texas[3]	$23,942	(13)	16.0	$1,496	8.3	(7)	465.3	(6)
Utah	NA		NA	NA	NA		NA	
Vermont[2]	$2,633	(29)	5.0	$527	0.3	(24 tie)	44.5	(36)
Virginia	$13,905	(17)	17.0	$818	0		122.7	(24)
Washington	$14,147	(16)	34.7	$408	23.7	(3)	479.3	(5)
West Virginia	$217	(33)	1.0	$72	0.3	(24 tie)	117.3	(26)
Wisconsin	NA		NA	NA	1.3	(16 tie)	239.3	(14)
Wyoming	$500	(32)	1.0	$500	0.3	(24 tie)	5.3	(40)
Number of States Responding	37		36	36	40		40	
Average Among Survey Respondents	$44,998		53.1	$3,434	5.6		289.9	

[1] Information based on the N.C. Center for Public Policy Research's survey of state pesticide programs. Table based on state responses (for the years 1990–92) to the following survey questions: (a) How many fines did your agency assess in numbers and total dollar amounts? (b) How many licenses or certifications did you suspend or revoke? (c) In how many cases did your agency take any kind of regulatory action? NR = State did not respond to survey; NA = State did not answer this survey question.

[2] Data from California, Florida, Oregon, and Vermont are from 1991 and 1992 only.

[3] Data from Florida, Georgia, Louisiana, and Texas do not include structural pest control violations.

[4] Iowa, Nebraska, and Nevada could not assess fines on pesticide violators during the time period covered by this survey, but all three states now have that authority.

"Recertification [in North Carolina] is a total joke—it's like one evening every three years" for most private applicators.

—ALLEN SPALT, DIRECTOR
AGRICULTURAL RESOURCES CENTER

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tions. "That I would agree with 100 percent," says Wayne Slaughter, the aerial applicator from Farmville. "If we've got a problem here, then let's go through education first and try to alleviate the problem before it occurs." Steve Taylor, owner of Capital Pest Services in Raleigh and past president of the pest control association, says: "I very strongly favor increased training requirements, and I think most structural pest control operators would agree."

But John H. Wilson, who coordinates North Carolina's pesticide training program for the Cooperative Extension Service, says it's misleading to compare states by just looking at the number of hours required for recertifications. North Carolina was the first state to develop training manuals for pesticide applicators, he says, and those materials have been used as models by EPA and many other states. "I think the quality of our training has probably been the best of any state in the U.S.," says Wilson, a professor of horticultural science at N.C. State University. "I don't think there's a state in the U.S. that hasn't gone to school using North Carolina training manuals. We had training manuals by 1974, when nobody else had any."

Another way to compare state training programs is to look at the range of topics they cover. (See Table 25 on p. 90.) Most of the states surveyed (including North Carolina) have classes covering: health and safety; first aid for pesticide poisonings; alternatives to pesticides; biological pest controls; integrated pest management; farmworker safety; and pollution prevention. However, only six states (not including North Carolina) provide training in organic farming—that is, methods of growing fruits and vegetables without the use of pesticides and chemical fertilizers. (See related articles concerning organic farming on pp. 92–94, farmworker safety on pp. 29–31, and integrated pest management on pp. 85–87.)

Perhaps most surprising was the finding that less than one-~~fourth~~ half of the states (~~24~~ 27 percent) had established programs for educating farmworkers about pesticide safety and use at the time of the survey (August 1993). This was surprising given that the EPA issued new protection standards for farmworkers and others who apply pesticides in 1992. The EPA's Worker Protection Standard initially was supposed to take effect April 1994, but Congress postponed many of the requirements until Jan. 1, 1995. Among its requirements, the standard mandates that employers train agricultural workers about pesticide safety and post bilingual signs summarizing basic information.[9]

The N.C. Pesticide Board adopted new farmworker protection regulations in 1993 that include training requirements.[10] But the board considered asking the EPA for a one-year delay in implementing the rules—until it heard testimony from a contingent of farmworkers at its November 1993 meeting. "We are never given any training in pesticides," Alfredo Vasquez, a migrant worker from Guatemala, told the board.[11] Other farmworkers told the board that they had gotten

"The quality of our training has probably been the best of any state in the U.S. I don't think there's a state in the U.S. that hasn't gone to school using North Carolina training manuals. We had training manuals by 1974, when nobody else had any."

—JOHN H. WILSON, PESTICIDE TRAINING COORDINATOR
N.C. COOPERATIVE EXTENSION SERVICE

sick while picking crops, yet rarely received any warnings about recent pesticide applications. (See the accompanying story, "Farmworkers Seek Training About Pesticide Safety," on pp. 29–31, for more information about workers' concerns.)

The Pesticide Board had considered seeking the delay because of anticipated costs and a lack of EPA-approved training materials. "The board is concerned that the complexity of the regulation will make implementation by the state and compliance by agricultural employers difficult," the board wrote in a letter to the EPA. "Costs such as training equipment, increased employer liability, and reduced flexibility in farm operations will be real and significant."[12] Other state pesticide programs voiced similar concerns, which helped convince Congress to delay the rules.

Comparing Pesticide Programs Based in Agriculture Departments With Those in Environmental Agencies

Perhaps no issue in state pesticide regulation has caused more debate than the question: Can an agricultural agency regulate pesticides without favoring farmers at the expense of public health and the environment? Environmentalists generally answer "No" to that question. "There's an inherent conflict of interest for the pesticide program to be located in the agriculture department," says Allen Spalt of the Agricultural Resources Center, a Carrboro-based environmental group that focuses on agricultural issues. "This is not an agricultural problem; it's an environmental and human health problem."

Table 22.
Leading State Pesticide Programs in Fines Levied on Violators, 1990–92

State	Total Fines Per Year, 1990–92	(Rank)[1]	Average Amount Per Fine	(Rank)[2]	Annual Fines Per 1,000 People	(Rank)[3]	Annual Fines Per 1,000 Acres of Crops	(Rank)[4]
New York	$416,943	(1)	$4,483	(4)	$23.18	(4)	$117.78	(6)
California	387,300	(2)	440	(24)	13.01	(7)	80.74	(7)
Louisiana	153,833	(3)	6,688	(3)	36.45	(2)	35.20	(9)
Connecticut	116,417	(4)	43,656	(2)	35.42	(3)	895.52	(1)
New Jersey	106,479	(5)	619	(15)	13.77	(6)	295.78	(3)
Massachusetts	61,733	(6)	46,300	(1)	10.26	(11)	440.95	(2)
North Carolina	**60,658**	**(7)**	**601**	**(17)**	**9.15**	**(13)**	**13.88**	**(12)**
Tennessee	52,500	(8)	772	(13)	10.76	(9)	11.72	(14)
North Dakota	35,528	(9)	446	(22)	55.60	(1)	1.67	(24)
Oklahoma	27,250	(10)	1,858	(7)	8.66	(14)	2.81	(23)

[1] Information based on the N.C. Center for Public Policy Research's survey of state pesticide programs. Rank among the 37 states that responded to this survey question.

[2] Total dollars in fines divided by total number of fines. Other top 10 states in average fines were: Rhode Island, $3,500 (5); Florida, $2,725 (6); Missouri, $1,600 (8); Texas, $1,496 (9); and Delaware, $989 (10).

[3] Total fines per year divided by state population (in 1,000s) as reported in 1990 U.S. Census. Other top 10 states in fines by population were: South Dakota, $16.27 (5); Colorado, $11.32 (8); and Hawaii, $10.51 (10).

[4] Total annual fines divided by 1990 harvested cropland (in 1,000s of acres) as reported by the U.S. Bureau of the Census, *Statistical Abstract of the United States: 1992* (112th edition), Washington, D.C., 1992, p. 660. Other top 10 states in fines by crop acreage were: Rhode Island, $233.30 (4); Hawaii, $145.63 (5); Delaware, $46.33 (8); and Maine, $34.96 (10).

Table 23.
Leading State Pesticide Programs in Numbers of Applicator Licenses Suspended or Revoked, 1990–92

State	Number of Licenses Suspended or Revoked Per Year	(Rank)[1]	Suspensions and Revocations Per Million People	(Rank)[2]	Suspensions/Revocations Per 1 Million Acres of Crops	(Rank)[3]
California	96.0	(1)	3.32	(5)	20.00	(2)
South Carolina	25.3	(2)	7.27	(1)	12.36	(4)
Washington	23.7	(3)	4.86	(2)	5.68	(5)
Colorado	15.3	(4)	4.64	(3)	2.61	(8)
Iowa	10.7	(5) tie	3.85	(4)	0.46	(19)
North Carolina	**10.7**	**(5) tie**	**1.61**	**(9)**	**2.44**	**(9)**
Texas	8.3	(7)	1.47	(17)	0.45	(20)
Mississippi	4.7	(8)	1.83	(8)	0.99	(13)
Connecticut	4.3	(9)	1.31	(10)	33.31	(1)
Michigan	3.0	(10)	0.32	(21)	0.46	(18)

[1] Information based on the N.C. Center for Public Policy Research's survey of state pesticide programs. Average number among 37 state pesticide programs that responded to this survey question.

[2] Average number of suspensions and revocations per year divided by state population (in millions) from 1990 U.S. Census. Other top 10 states in suspensions by population were: South Dakota, 2.87 (6), and Montana, 2.18 (7).

[3] Average number of suspensions and revocations per year divided by state crop acreage (in millions) in 1990 as reported by the U.S. Bureau of the Census, *Statistical Abstract of the United States: 1992* (112th edition), Washington, D.C., 1992, p. 660. Other top 10 states in suspensions by crop acreage were: Massachusetts, 19.07 (3); Hawaii, 4.13 (6); New Jersey, 2.78 (7); and Nevada, 1.92 (10).

Agricultural interests generally disagree. "Following this logic, agencies that promote health would not be qualified to enforce health regulations either," says Anne Coan, natural resources director for the N.C. Farm Bureau Federation. "Instead I believe that there are dedicated state employees in the [N.C. Department of Agriculture] doing their duties as assigned to them by the General Assembly, whether or not some other part of their agency is involved in promoting agriculture." Proponents contend that agricultural agencies can regulate pesticides more effectively because of their knowledge of crops, pest problems, and pesticide use. Agricultural agencies also have existing relationships with farmers and other applicators through certification programs and cooperative extension services.

"The agricultural [pesticide] programs might be being run quite a bit more efficiently," Coan says. "They generally deal with these kinds of populations. So, therefore, they may have more access, more databases to draw on, and more personnel in the field."

North Carolina is not alone in this debate. As previously noted, the Center's survey found that most states (86 percent) regulate pesticides through their agriculture departments. And lawmakers in many of those states have considered moving their pesticide programs to health or environmental agencies.[13] "That's definitely been an issue in Washington [state], and it recurs every time the legislature convenes," says Ann Wick, program manager for the Washington Department of

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"Our job is to protect the environment as much as possible. We're more like cops. The agriculture people want the best bug-killer out there that will get a crop ready for harvest."

—James Moran, Chief
New York Bureau of Pesticide Regulation

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Agriculture's Pest Management Division. California, which has the largest state budget for pesticide regulation, moved its program from the Department of Agriculture to the Environmental Protection Agency in the 1991–92 fiscal year.

The Center's survey results suggest that other state legislatures ought to consider the issue. The survey found substantial differences when states with agriculture-based pesticide programs were compared with environmental and university-based programs. (See Table 26 on p. 91.) On average, the environmental-based programs had much larger budgets and staffs. The environmental programs also had a higher level of regulatory activity. That is, they levied more fines, suspended or revoked more licenses, and investigated more complaints. Such trends held up even when the numbers were adjusted for the populations and crop acreages of states.

However, the interpretation of these differences depends on one's philosophical assumptions. A person who believes that higher levels of regulatory activity indicate more problem-solving would say that pesticide programs are better when based in environmental agencies. But others might contend that better training occurs in agricultural agencies, thus leading to a lower level of regulatory activity. In their eyes, more regulation is worse, not better. "If you're a farmer, you would say, 'We don't want to go that way,'" says Jerry Coker, chairman of the N.C. Pesticide Board. "But if you're an environmentalist, you might say, 'They're really nailing the violators.'"

Administrators in states with environmental-based pesticide programs say they aren't surprised by the results. "Our job is to protect the environment as much as possible," says James Moran, chief of the New York Bureau of Pesticide Regulation. "We're more like cops. The agriculture people want the best bug-killer out there that will get a crop ready for harvest." Others cite potential conflicts of interest in agricultural agencies simultaneously promoting and regulating pesticide use. "If we were in the same program, how could we regulate them and also encourage them?" says Carmen Valentin of the New Jersey Pesticide Control Program. "We feel that it's a conflict of interest. It wouldn't serve the public for us to be in agriculture."

Administrators of agriculture-based programs say several factors could account for the discrepancies. "That doesn't surprise me at all," says Wick of the Pesticide Management Division in Washington state. "We have seen that the environmental agencies have much higher fines and penalties." Other agricultural administrators suggest that environmental programs aren't doing as good a job educating pesticide applicators—thus leading to more violations. "California has a tremendous reputation based on regulation," says John H. Wilson, the coordinator of North Carolina's pesticide training program. "Everybody thinks California walks on water. But when it comes to training, they're no better than a lot of states."

Pesticide administrators in California and other states with programs in environmental agencies, however, bristle at suggestions that they are not educating applicators as well as agricultural agencies. "We're pretty aggressive with both education and enforcement," says John Orrok, enforcement chief in the New Jersey Pesticide Control Program. "By aggressive, I don't mean

"The basic premise is that we don't act against agricultural people, when in fact we do. All you have to do is look at our case files. You will see farmers, commercial applicators, corporate giants—all where we've taken actions against them."

—John L. Smith, Pesticide Administrator
N.C. Department of Agriculture

Table 24.
Leading State Pesticide Programs in Numbers of Complaints Investigated, 1990–92

State	Number of Cases Investigated Per Year	(Rank)[1]	Investigations Per 1 Million People	(Rank)[2]	Investigations Per 1 Million Acres of Crops	(Rank)[3]
California	3,656.0	(1)	122.8	(4)	762.1	(4)
North Carolina	**927.0**	**(2)**	**139.8**	**(3)**	**212.1**	**(9)**
Oklahoma	576.3	(3)	183.2	(1)	59.4	(19)
New Jersey	503.0	(4)	65.1	(15)	1,381.9	(2)
Washington	479.3	(5)	98.5	(7)	115.0	(14)
Texas	465.3	(6)	27.4	(28)	25.1	(29)
Florida	416.0	(7)	32.1	(26)	386.6	(7)
Oregon	345.7	(8)	121.6	(5)	151.0	(12)
Ohio	325.3	(9)	30.0	(27)	32.1	(25)
Michigan	305.3	(10)	32.8	(25)	46.9	(22)

[1] Information based on the N.C. Center for Public Policy Research's survey of state pesticide programs. Average number of complaints investigated per year, 1990–92, among 40 state pesticide programs that responded to this survey question. Data available for the years 1991 and 1992 only from California, Georgia, and Vermont; available for 1992 only from Maine. Data from Florida, Georgia, Louisiana, and Texas do not include structural pest investigations.

[2] Number of cases investigated per year divided by state population (in millions) from 1990 U.S. Census. Other top 10 states in investigations by population were: South Dakota, 150.8 (2); Montana, 106.9 (6); Mississippi, 95.2 (8); South Carolina, 85.1 (9); and Hawaii, 80.1 (10).

[3] Average number of cases investigated per year divided by acres of crops harvested (in millions) as reported by the U.S. Bureau of the Census, *Statistical Abstract of the United States: 1992* (112th edition), Washington, D.C., 1992, p. 660. Other top 10 states in investigations by crop acreage were: Connecticut, 1,803.9 (1); Hawaii, 1,122.8 (3); Rhode Island, 730.0 (5); Massachusetts, 451.9 (6); Arizona, 213.6 (8); and Maine, 185.6 (10).

unfair. I think we do the education, but we have the enforcement backing for violators when we need it." Also, virtually all states (including North Carolina) train pesticide applicators through their cooperative extension services—regardless of whether they regulate pesticides through an agriculture or environment agency. "Moving administrative responsibilities for the pesticide programs to the environment department would not necessarily have any effect on the education programs," says Erick Umstead, research director for the Agricultural Resources Center in Carrboro.

North Carolina's Program More Active Than Most

North Carolina's pesticide program, however, is clearly not a laggard compared to other states. North Carolina is among the leaders in spending and staffing as well as the numbers of fines, suspensions, and complaints investigated. Its regulatory responsibilities and powers are among the broadest of the states surveyed.

"I don't think you could point a finger at North Carolina," says Von McCaskill, head of

South Carolina's pesticide program, which is based at Clemson University. "I am very familiar with that program, and I think they do a very good job." That view is seconded by Robert Fugitt, governmental affairs manager for DuPont chemical company in Wilmington, Del. "North Carolina has a good program," Fugitt says. "There are a lot of states that have taken a pretty laissez-faire attitude toward agriculture. We deal with all of the states. And North Carolina is one of the states we pay a lot of attention to—because they're strict and they're rigid."

Nevertheless, states with pesticide programs based in environmental agencies were higher on average than North Carolina in virtually every category—budgets, staffs, fines, and suspensions. North Carolina was higher than the states with

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Table 25.
Summary of State Training Programs for Pesticide Users

Question (Number of States Responding)[1]	**All States (Percent Yes)**	**North Carolina**[2]
Does the state license or certify pesticide users beyond the minimum federal requirements? (44)[3]	84%	Yes
Does the state require that pesticide users pass written examinations showing knowledge of pesticide safety and use to obtain or renew licenses or certifications? (45)	98%	Yes
Does the state have a pesticide education program *aimed at* farmworkers? (45)	47% ~~24%~~	Yes
Which topics does the state pesticide applicator training or education program include? (44)		
Health and safety issues	98%	Yes
Integrated pest management	98%	Yes
Farmworker safety	95%	Yes
First aid for pesticide poisonings	91%	Yes
Pollution prevention	89%	Yes
Alternatives to chemical pesticides	80%	Yes
Biological pest controls	70%	Yes
Organic farming	14%	No

[1] Number of states that answered this question in the N.C. Center for Public Policy Research's survey of state pesticide programs.

[2] Responses of "yes" to survey questions from the N.C. Department of Agriculture.

[3] The U.S. Environmental Protection Agency sets minimum certification requirements for applicators of restricted-use pesticides as specified by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), 7 U.S.C. Part 136v.

"We spray food with stuff that intentionally kills insects, and yet we have not demanded enough information to make sure it doesn't hurt us. The problem is: You can see a caterpillar, but you can't see what somebody sprayed on your food. Unfortunately, people think what you can't see ain't there."

—BILL DOW OF PITTSBORO, ORGANIC FARMER AND PHYSICIAN

Physician-Farmer

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of folks doing what I do, and they're making it. I can't speak for anyone else, but we're doing fine."

North Carolina has an estimated 500 organic farmers, according to the Agricultural Resources Center, a Carrboro-based environmental group that promotes alternative farming methods. The growing interest in organic farming has even prompted action by the N.C. Department of Agriculture. In February, Agriculture Commissioner Jim Graham announced the opening of a 2,300-acre experimental farm near Goldsboro that will be used to conduct research on organic farming and other kinds of "sustainable" agricultural techniques.[1]

But, for evidence that organic techniques can work, one only needs to look at the produce that Dow grows on his farm. His tomato vines bend from the weight of lush, red fruits. His pepper plants are laden with huge, shiny orange and yellow pods. The fragrant herbs can be smelled just walking through the orderly rows of crops.

"The bottom line for most people is, 'What does it look and taste like?'" Dow says. "We can compete with the best of them."

—Tom Mather

FOOTNOTE

[1] The Department of Agriculture's experimental farm is called The Center for Environmental Systems. The department is operating the farm in partnership with the College of Agriculture and Life Sciences at N.C. State University and the School of Agriculture at A&T State University. For more details, see Martha Quillin, "Pesticides no longer the pick at Cherry Farm," *The News & Observer* (Raleigh, N.C.), Feb. 2, 1994, p. 3A.

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pesticide programs based in environmental agencies in only one category, the number of complaints investigated.

Spalt, of the Agricultural Resources Center, says the survey clearly shows that the N.C. General Assembly should move pesticide regulation from the Department of Agriculture to the Department of Environment, Health, and Natural Resources. "The data shows that if a pesticide program is in an environmental agency, the fines will be much higher," Spalt says. "Even in the areas where North Carolina's numbers look good, they're less than half what they are in the environmental states."

But state agricultural officials say the survey results show they are doing a good job of balancing agricultural interests with health and environmental concerns. "The basic premise is that we don't act against agricultural people, when in fact we do," says Pesticide Administrator John Smith. "All you have to do is look at our case files. You will see farmers, commercial applicators, corporate giants—all where we've taken actions against them. But we don't have a police state. Our efforts are to educate, to try to get them to do it the right way. And then we use the regulatory system to ensure compliance.... We've got a strong commitment within this department to carry this program out."

Others say it's a mistake to assume that states with larger budgets or higher numbers of enforcement actions are doing a better job of protecting health or the environment. "That [survey] doesn't measure whether the environment is really better or not," says Jerry Coker, the N.C. Pesticide Board's chair. "That's still an unanswered question. The real bottom line you never know is which states are getting the best environmental protection for the money."

(Center intern Kevin Scott provided research assistance for this article.)

FOOTNOTES

[1] The Federal Food, Drug, and Cosmetic Act (21 U.S.C. 301 *et seq.*) delegates to the EPA further regulatory authorities, primarily relating to the amounts of pesticide residues allowed on foods.

[2] Previous studies that examine various aspects of pesticide regulation by state include:

The National Center for Policy Alternatives, a Washington-based research group, has published several reports highlighting model pesticide programs in selected states and recommending general policy improvements. See Anne Hoskins and Jeffrey Tryens, *The Harvest: State Strategies for Sustainable Agriculture*, 1990; and Tani Adams and J. Tryens, *The Pesticides Crisis: A Blueprint for States*, 1988. Both publications are available from the National Center for Policy Alternatives, 1875 Connecticut Ave., NW, Washington, D.C., 20009. Phone: (202) 387-6030.

The National Coalition Against the Misuse of Pesticides, a Washington-based environmental group, has compiled a collection of state laws and local pesticide ordinances. See, "State and Local Pesticide Ordinances," National Coalition Against the Misuse of Pesticides, 701 E St. SE, Washington, D.C., 20003. Phone: (202) 543-5450.

Renew America, a Washington-based public interest group, has published reports that rank states on various environmental factors and policy measures, including pesticide regulation. See Scott Ridley, "The State of the States," 1988 and 1989, Renew America, 1001 Connecticut Ave. NW, Suite 719, Washington, DC, 20036. Phone: (202) 466-6880.

The Institute for Southern Studies, a public interest group based in Durham, N.C., has published a book that ranks states on numerous environmental factors, including several measures of pesticide use and regulation. See Bob Hall and Mary Lee Kerr, *1991–92 Green Index*, Island Press, Suite 300, 1718 Connecticut Ave., NW, Washington, D.C., 2009.

The Council of State Governments, a Lexington, Ky., based organization that researches state government policies, publishes a guide to state environmental management that includes information on budgets and the administration of pesticide programs. See R. Steven Brown and Karen Marshall, *Resource Guide to State Environmental Management*, 1993, The Council of State Governments, 3560 Iron Works Pike, Lexington, Ky., 40578. Phone: (800) 800-1910.

[3] The Center chose population and acres of harvested crops to adjust its numbers because data were readily available for each state from the U.S. Census Bureau. However, the Center recognizes limitations exist for both measures. For instance, total crop acreage might be a better measure of agricultural activity in some states, such as Hawaii, that have large amounts of pineapple, sugarcane, and other crops that are not harvested annually.

[4] U.S. Bureau of the Census, *Statistical Abstract of the United States: 1992* (112th edition), Washington D.C., 1992.

[5] When the Center surveyed state pesticide programs in August 1993, Nebraska was the only state that lacked enforcement powers. Since then, however, the Nebraska legislature has enacted legislation enabling the state to assume pesticide enforcement responsibilities from the EPA. The Nebraska legislature also increased its pesticide program's annual budget to $750,000.

[6] N.C.G.S. 143-468 created a Pesticide Environmental Trust Fund to help pay for new health and environmental programs. The law imposes additional registration fees on pesticide products, with one-fourth of the funds being used to pay for agromedical efforts at N.C. State and East Carolina universities. Three-fourths of the funds are earmarked for the Department of Agriculture's environmental programs, including the monitoring of groundwater pollution by pesticides and the disposal of pesticide containers. North Carolina already charged registration fees of $30 per pesticide product. The new law imposes additional assessments of $25 per product for pesticides with sales less than $5,000 a year, and $50 per product for those with sales greater than $5,000 a year.

[7] For further discussion of the state's pesticide oversight boards, see the N.C. Center for Public Policy Research's report, *Boards, Commissions, and Councils in the Executive Branch of North Carolina State Government*, 1984, pp. 77–95 and 192–194.

[8] North Carolina requires notification in two limited circumstances: aerial applicators seeking to spray in restricted areas, such as parks; and those spraying within 1/2-mile of registered apiaries (bee colonies).

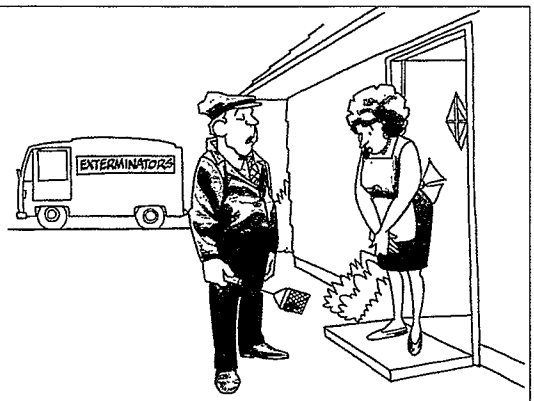
[9] In early 1994, Congress delayed implementation for most of the requirements in its Worker Protection Standard until Jan. 1, 1995.

[10] 2 N.C. Administrative Code 9L .1805.

[11] See Stuart Leavenworth, "State won't request pesticide rules delay," *The News & Observer* (Raleigh, N.C.), Nov. 10, 1993, p. 5A.

[12] From a news release issued by the N.C. Department of Agriculture, Nov. 12, 1993.

[13] The N.C. General Assembly debated the issue of moving its pesticide program in 1989, when it consolidated most of the state's environmental programs into the new Department of Environment, Health, and Natural Resources. Legislators decided to leave the pesticide program in the Department of Agriculture, however, in response to complaints from farmers and other agricultural interests.



"I may be slow, madam, but I'm thorough."