Occupational Health Nurses in Agricultural Communities
North Carolina Farm Injury Project Summary

1990 – 1996

Prepared by

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North Carolina Farm Injury Project, 1990-1996

I. Background

Agriculture is a major contributor to North Carolina's economy. An estimated 30 percent of North Carolina's gross income comes from agriculture and agriculture-related industries. In addition, agriculture employs over 23 percent of the North Carolina work force (NC Agricultural Statistics, 1993). North Carolina has been consistently ranked number one in US Agriculture for flue-cured tobacco and total tobacco, turkeys raised, and sweet potatoes. Based on 1997 data, other items ranked in the top five commodities include hogs and pigs, Christmas trees, and trout sold (second); poultry and poultry products and cucumbers for pickles (third); and commercial broilers, peanuts, and strawberries (fourth). The number of hogs on farms has increased dramatically over the years; North Carolina now ranks second in the United States in hog production.

Total commodities sold in North Carolina in 1997 were valued at about $8,301,809, of which crops represented $3,608,171 (43.4%) and livestock represented $4,693,638 (56.5%). According to 1997 NC Agricultural Statistics, the leading commodities included poultry and eggs ($2,209,530 or 26.6%); hogs ($2,016,643 or 24.3%); and tobacco ($1,193,155 or 14.4%). In 1990, there were approximately 62,000 farms with 9,700,000 acres; the average farm size was 156 acres. In 1997, there were approximately 57,000 farms with 9,000,000 acres; the average farm size was 158 acres. The trend seems to be toward a decreasing number of farms and a slight increase in the average farm size.

II. Project Description

A. Goals

1. Identify and report agricultural injuries and illnesses in North Carolina.
2. Increase the awareness of farm workers regarding occupational hazards and how to prevent them.

B. Overview

In September 1990, North Carolina was one of ten states funded by the National Institute for Occupational Safety and Health (NIOSH) for the Occupational Health Nurses in Agricultural Communities (OHNAC) cooperative agreement. This project, housed in the Occupational Health Section of the North Carolina Department of Environment, Health and Natural Resources (now the Occupational & Environmental Epidemiology Branch of the North Carolina Department of Health and Human Services), was referred to as the North Carolina Farm Injury Project or FIP. Four full-time nurses (project coordinator and three agricultural health field nurses), a migrant health technician (20 hours/week), and a public health epidemiologist (20 hours/week) were hired to implement the project. The three field nurses and migrant health technician worked out of the Washington Regional Office in Beaufort County.

The project coordinator, epidemiologist, and project director were based in Raleigh at the Central Office of the state public health agency.

A community-based active reporting system was initially established in four eastern North Carolina counties (Martin, Pitt, Tyrrell, and Washington) and expanded in 1994 to a total of eight counties (added Beaufort, Bertie, Green, and Hyde). See Map 1: Project Location. A *Farm Injury Report* form was developed to aid the reporting of farm-related injuries and illnesses to the Project. Cooperative reporting agreements were arranged with community hospitals, trauma centers, physicians, emergency medical services, dentists, local health departments, veterinarians, and other health care providers. Other reporters included agricultural agencies, community agencies, and those who suffered farm-related incidents. The actual reporting was done in a variety of ways. Reporters completed and mailed the *Farm Injury Report* to the Regional Office; staff periodically stopped by physicians' offices to collect completed forms; some reporters faxed in the form; and others used the toll-free number for reporting purposes. A *Case Follow-up Interview* form was developed to aid staff in collecting in-depth information about the number of incidents, severity, and circumstances surrounding injuries and illnesses. As news about the Farm Injury Project (FIP) grew, other counties beyond the eight-county area also submitted reports of farm injuries and illnesses.

Staff reviewed all reports of known and suspected agriculture-related injuries and illnesses to farmers, farm family members, and farm workers (including migrant and seasonal farm workers). In-depth case follow-up interviews were conducted on all fatalities and illnesses, and on injuries involving tractors and other farm machinery and equipment. Interviews were also conducted for animal-related injuries, amputations, falls from elevations, pesticide exposures, injuries occurring in farm shop areas, and any farm-related injury or illness involving a child.

To increase farm worker awareness regarding occupational hazards and how to prevent them, six focus groups were held to help staff and others understand the perceptions of farm workers about farm hazards. The focus groups were held during February and March of 1993. The 32 participants included teenagers, farmers, farm workers, and farm women from Martin, Pitt, Tyrrell, and Washington counties. Local community leaders, after attending training sessions held by a research firm, guided the discussion during the focus groups. All sessions were tape-recorded, transcribed, and analyzed by a graduate-level occupational health nursing student with input from FIP staff. Staff used the information gathered to plan educational programs. The findings indicated a high level of awareness of occupational hazards in all groups, but a great variation in the perception of work from group to group. One group of farmers thought farms were safe places to work; another group of farmers responded "safe places compared to what?" and the farm women group thought farms were dangerous places. The two groups that expressed the highest perception of risk, and the least amount of control, were the farm women's group and the African-American farm

workers. Chemical hazards were seen as the most important contributor to occupational illnesses.

The data were used to target specific interventions in different farm worker populations. For example, the farm women's group was skeptical about the relationship of farm-related noise to hearing loss, so staff provided education about noise levels of different farm machinery using sound level meters.

III. Results

Once information was identified through community surveys and focus groups, staff performed data reviews of all reports submitted from the FIP service area. Analysis of reports provided information regarding the different types of incidents, the frequency of their occurrence, and the common causes of those incidents.

A. Surveillance Findings

From January 1, 1992 through September 30, 1996, there were 587 agricultural injuries and illnesses reported to the Farm Injury Project. Of these, 527 (89.8%) were injuries, 52 (8.8%) were illnesses, and 8 (1.4%) were fatalities due to injury. There was a decrease in the number of reports from 1994 to 1995 (26.5%) and from 1995 to 1996 (42.9%) if 1996 is extrapolated to a full year of data. See Table 1.

Table 1: Number and Type of Farm Injury and Illness Events in NC by Year, 1992-1996

Events	1992	1993	1994*	1995*	1996*^ (Jan-Sep)	Total and Percent
Injury	123	104	150	102	48	527 (89.8%)
Illness	3	19	12	15	3	52 (08.8%)
Fatality	2	4	0	2	0	8 (01.4%)
Total	128	127	162	119#	51+	587 (100.0%)

* Beaufort, Bertie, Greene, and Hyde Counties started reporting in 1994.
^ Funding ended in September 1996.
# Represents a 26.5% decrease between 1994 and 1995
+ Represents a 42.9% decrease between 1995 and 1996 if 1996 extrapolated to full year

Overall, white males between the ages of 20-39 years, about one-third of whom were Hispanic, suffered farm-related events more often. See Tables 2 and 3.

Table 2: Age Characteristics of Farm Injury and Illness Events in NC, 1992-1996

Age	1992	1993	1994*	1995*	1996*^ (Jan–Sep)	Total and Percent
1 – 9	0	3	2	0	2	7 (01.3%)
10 – 19	24	19	17	14	5	79 (13.5%)
20 – 29	38	34	49	41	17	179 (30.5%)
30 – 39	35	26	34	14	9	118 (20.1%)
40 – 49	17	23	23	28	7	98 (16.7%)
50 – 59	9	6	18	8	7	48 (08.2%)
60 – 69	1	12	11	6	3	33 (05.7%)
70 +	2	3	5	3	0	13 (02.3%)
Unknown	2	1	3	5	1	10 (01.7%)
Total	128	127	162	119	51	587 (100.0%)

* Beaufort, Bertie, Greene, and Hyde Counties started reporting in 1994.
^ Funding ended in September 1996.

Table 3: Other Demographic Characteristics of Farm Injury and Illness Events in NC, 1992-1996

Indicator	1992	1993	1994*	1995*	1996*^ (Jan-Sep)	Total and Percent
Sex						
Male	117	118	149	110	47	541 (92.2%)
Female	11	9	13	9	4	46 (07.8%)
Race						
White	87	94	115	87	19	402 (68.5%)
Black	40	33	21	17	9	120 (20.4%)
Am. Indian	0	0	1	1	0	2 (00.3%)
Other	0	0	0	0	1	1 (00.2%)
Unknown	1	0	25	14	22	62 (10.6%)
Ethnic Group						
Hispanic	39	50	56	40	19	204 (34.7%)
Non-Hispanic	89	77	106	79	18	369 (62.9%)
Unknown	0	0	0	0	14	14 (02.4%)

* Beaufort, Bertie, Greene, and Hyde Counties started reporting in 1994.
^ Funding ended in September 1996.

The majority (about one-half) of those ill or injured resided in Pitt County, the most populous. Pitt County is a leading county for all tobacco, soybean, wheat, and cotton production; it is also a leading county for hogs and pigs, and all chickens. Approximately one-third of the events were reported to FIP from the Level I Trauma Center in Pitt County. An increase in the number of reports by physicians was seen over time. See Tables 4 and 5.

Table 4: Number of Reports by NC County of Residence, 1992-1996

County of Residence	1992	1993	1994*	1995*	1996*^ (Jan-Sep)	Total and Percent
Beaufort	-	-	4	4	5	13 (02.2%)
Bertie	-	-	4	2	0	6 (01.0%)
Greene	-	-	12	13	4	29 (05.0%)
Hyde	-	-	26	21	4	51 (08.6%)
Martin	20	32	30	15	5	102 (17.4%)
Pitt	88	73	66	52	28	307 (52.3%)
Tyrrell	4	4	2	3	0	13 (02.2%)
Washington	16	18	18	9	2	63 (10.8%)
Unknown	0	0	0	0	3	3 (00.5%)
Total	128	127	162	119	51	587 (100.0%)

* Beaufort, Bertie, Greene, and Hyde Counties started reporting in 1994.
^ Funding ended in September 1996.

Table 5: Number of Reports by Type of Reporting Agency in NC, 1992-1996

Reporting Agency	1992	1993	1994*	1995*	1966*^ (Jan-Sep)	Total and Percent
Trauma Center	52	46	52	30	21	201 (34.2%)
Local Hospital	26	32	58	37	11	164 (28.0%)
Physician Office	37	22	22	40	16	137 (23.3%)
Local Hth Dept.	8	15	27	11	3	64 (10.9%)
Other	5	12	3	1	0	21 (03.6%)
Total	128	127	162	119	51	587 (100.0%)

* Beaufort, Bertie, Greene, and Hyde Counties started reporting in 1994.
^ Funding ended in September 1996.

Types of farm-related injury and illness reported are described in Table 6. The main injuries were lacerations and abrasions, sprains and strains, fractures, and punctures. This is similar to national workers' compensation data which indicated that typical agricultural injuries are sprains/strains, cuts/lacerations, or contusions involving contact of extremities or head with work surfaces, livestock, or hand tools (Cohen, Moll, Maley, & Linn, 1989).

Table 6: Type of Event in NC, 1992-1996

Type of Event	1992	1993	1994*	1995*	1996*^ (Jan-Sep)	Total and Percent
Amputation	4	4	2	8	2	20 (03.5%)
Burn	5	3	4	1	0	13 (02.3%)
Chemical exposure	0	2	3	7	0	12 (02.0%)
Contusion	16	7	10	9	1	43 (07.3%)
Crushing injury	6	8	13	6	1	34 (05.8%)
Dermatitis	0	2	1	4	2	9 (01.5%)
Foreign body—eye	3	6	4	2	0	15 (02.6%)
Fracture	13	10	25	11	7	66 (11.2%)
Green tobacco sickness	2	4	0	0	0	6 (01.0%)
Heat	2	0	0	0	0	2 (00.3%)
Laceration/abrasion	31	34	35	31	20	151 (25.7%)
Hearing loss	0	2	0	0	0	2 (00.3%)
Pesticide exposure	0	0	2	4	0	6 (01.0%)
Puncture wound	19	9	13	13	8	62 (10.6%)
Respiratory exposure	0	3	0	0	0	3 (00.5%)
Skin cancer	0	3	5	2	1	11 (01.9%)
Sprain/strain	25	17	13	14	6	75 (12.8%)
Other	2	13	32	7	3	57 (09,7%)
Total	128	127	162	119	51	587 (100.0%)

* Beaufort, Bertie, Greene, and Hyde Counties started reporting in 1994.
^ Funding ended in September 1996.

The typical cause of injury was being struck by or caught in, under, or between objects, such as farm equipment, tools, and animals. See Table 7.

Table 7: Cause of Farm Injury, 1992-1996, in NC

Cause of Injury	1992	1993	1994*	1995*	1996*^ (Jan-Sep)	Total and Percent
Struck by	38	44	50	46	17	195 (36.5%)
Caught in/under/between	37	8	36	33	16	130 (24.3%)
Falls—elevation	9	10	15	2	2	38 (07.1%)
Falls—same level	8	1	3	3	1	16 (03.0%)
Overexertion	11	4	8	4	2	29 (05.5%)
Motor vehicle crash	4	10	5	2	0	21 (03.9%)
Struck against	8	11	13	1	2	35 (06.5%)
Temperature	2	2	2	0	0	6 (01.1%)
Rubbed/abraded	2	2	2	0	0	6 (01.1%)
Cumulative trauma	2	0	1	1	0	4 (00.7%)
Electrical	0	1	1	0	0	2 (00.4%)
Other	4	15	14	12	1	46 (08.6%)
Unknown	0	0	0	0	7	7 (01.3%)
Total	125	108	150	104	48	535 (100.0%)

* Beaufort, Bertie, Greene, and Hyde Counties started reporting in 1994.
^ Funding ended in September 1996.

B. Outreach Activities

Based on the analysis of data, staff developed and implemented many injury prevention and health education programs targeted at farmers, farm families, and migrant and seasonal farm workers. Because children were involved with farm labor and were frequently injured, staff developed unique farm injury prevention programs as a way to help keep children safe. Successes of the Project were possible with the valuable partnerships of the North Carolina Cooperative Extension Services, Farm Bureau and Farm Bureau Women, Farm Credit, and the many livestock and grain associations represented in the state, as well as support from local agribusinesses. As knowledge of the various programs grew, so did requests from counties far beyond the Project's borders. See Map 2: FIP Outreach Across NC.

1. Communication

   A toll-free number was established to facilitate the reporting of farm-related injury and illness events, expedite patient interviews (patients could call back at their convenience), and enable anyone who had questions or wanted additional information to call at no charge. Fliers about the Project were also developed in English and Spanish.

2. Farm Safety Day Camps

   The Kids for Farm Safety Day Camps were held annually from 1994 to 1996, with increasing community involvement each year. In 1994, the camp was held at a local community college in Beaufort County. Eight health and safety stations were set up to educate children in a fun and interactive way about injury prevention and farm safety. About 150 people attended, including 84 camp participants ages 9-13, monitors, volunteers, media representatives, observers, parents, and safety station presenters. The camp was supported by the Farm Injury Project. In 1995 and 1996, the camps were held at the Vernon James Center in Plymouth, NC. A total of 272 attendees, of which 185 were campers aged 5-16, interacted with the 12 health and safety stations in 1995. This 1995 camp was supported by the Project along with community contributions. The 1996 camp was supported entirely from community contributions from 19 organizations and agencies, totaling over $5,000. This camp grew even more with nearly 300 attendees, of which 186 were campers. The lesson learned is that the community can take responsibility and has the resources to support agricultural health and safety programs. In this case, someone from a local cooperative extension office took the initiative to coordinate a farm safety day camp in the area. A farm safety day camp continues to be held in this area each year since the FIP ended.

3. Farm Wives' Dinners

   This program is an innovative teaching intervention developed by the FIP staff in collaboration with Farm Bureau Women, Farm Credit, and NC Cooperative Extension Service. The value of farm women as agents of health and safety for the farm and their family has become well known. Project staff focused on this knowledge and presented specialized programs on agricultural health and safety topics in an atmosphere of fellowship and fun. They also provided consultation to agricultural safety specialists in other states and in Canada to implement similar programs in their communities. More than 15 dinners were held from 1993-1996. Dinners continue to be held on a periodic basis since the Project ended.

4. School Programs

   Staff members presented a variety of programs within the school systems in the Project service area. Programs were conducted for elementary, middle, and high school students; Future Farmer classes; 4-H groups; and agricultural classes. Presenters have been repeatedly invited back to various school systems to provide safety programs to new students as well as to students who have heard the FIP safety messages before. The English as a Second Language (ESL) students received special attention from our Spanish-speaking migrant health technician. Additionally, churches became interested in providing these programs to their parishioners and offered their facilities to conduct safety programs for farm workers and their families.

5. FIP Fun Game

   One educational program that project staff developed is “FIP FUN,” an interactive and fun way to educate farmers, farm wives, and children about farm health and safety through a question-and-answer format. This game helps the participants gain knowledge about farm injuries and illnesses. Participants divide themselves into several groups. Project staff then ask the groups questions pertaining to agricultural health and safety. Categories of questions include general health and safety, farm health, and agricultural injury. Each question is worth from 10 to 40 points and tests the group’s knowledge of health and safety on the farm.

   FIP FUN promotes group cooperation and quick thinking, since only 15 seconds are given to answer the questions. While this may seem like a short amount of time, time is short in emergency situations. Decisions at work are usually made rather quickly and an uninformed decision can be deadly.

   The game can be informative for the whole family. For example, after learning about drowning hazards in the game, children can be the catalysts in equipping the farm pond with a rope or a long pole to help rescue a potential drowning victim. The game has been well received, enjoyed, and valued by many organizations across the state.

6. Swine Confinement Study

   As previously noted, North Carolina ranks second in the U.S. in pork production. While much work had been done related to swine confinement health hazards in other states, there was little data from North Carolina. In collaboration with the director of cooperative extension from Martin County and the staff industrial hygienists from the Occupational & Environmental Epidemiology Branch, the FIP staff assessed potential health hazards to farmers working in five different swine

confinement houses. Each worker involved in swine confinement farming at those houses completed a health questionnaire. Reported respiratory symptoms included allergies, cough, wheezing, hoarseness, frequent colds, and running nose.

A walkthrough of each farm was conducted during which the farmer was given an explanation of the monitoring process. On-site personal and environmental monitoring for dust, gases (ammonia, hydrogen sulfide, and carbon monoxide), endotoxins, and noise was then completed. While the dust, gases, and endotoxin levels were all below the ACGIH Standards, the average sound pressure levels ranged from 71.3 dB (A) to 87.6 dB (A). The peak noise level measured 119.6 dB(A) during feeding time. Minimal use of hearing protection was observed; workers on one farm wore earmuffs.

Primary recommendations included establishing a comprehensive hearing conservation program and maintaining adequate general ventilation in swine confinement buildings at all times.

C. Dissemination Activities

A variety of means was used to disseminate information and findings about the NC Farm Injury Project. Numerous oral and poster presentations were made by all Project staff on local, state, regional, national, and international levels. Presentations were made at the American Public Health Association (APHA); the International Congress on Occupational Health (ICOH); the International Congress of Agricultural Medicine and Rural Health; the First Annual Alabama Rural Health Association Conference; the North Carolina Division of the American Trauma Society; the Agricultural Safety and Health Council of the NC Department of Labor; and the World Conference on Injury Control.

A newsletter, *Farm Injury Project News*, was published and distributed semi-annually throughout the Project's area with a readership of over 500 people. It was sent to health care professionals, cooperative extension agencies, etc. Fact sheets were developed as a way to quickly alert individuals about specific events that may have caused or could cause serious injury or death. This idea was in response to focus group data and a short survey of farmers at a regional farm show. Topics included tire explosion and fire ant bites. A special issue of the *AAOHN Journal*, the professional journal of the American Association of Occupational Health Nurses, was devoted to agricultural health and safety. Nan Migliozzi (Ohio) and Susan Randolph served as guest co-editors. Other information about occupational surveillance was covered in the *North Carolina Medical Journal*. Outreach to the migrant population was successful through public service information spots on a Spanish radio station, presentations during evening church services, and on-site visits to migrant camps. Other media approaches, besides radio, included television appearances and newspaper articles.

Numerous presentations were made at farm shows (e.g., Southern Farm and Mid-Atlantic Farm Shows, NC Pork Producers Council, the Small Grain Growers' Conference, Farm Bureau State Convention, Peanut Growers and Cotton Growers conferences, Hospital Health Days, Soil and Water Conservation conferences, Women's Health Conference), schools, hospitals, and the occupational health nursing conference, which together reached 200,000+ people. Topics covered included skin cancer detection and prevention, hearing loss prevention, occupational hazards of farm women, identification of farm hazards, respiratory protection, first aid and cardiopulmonary resuscitation, etc. Tens of thousands of health and safety publications were distributed across the state.

Of great importance in improving reporting efforts was the inclusion of farm injuries in G.S. 130A-455-460 (Reportable diseases, illnesses, and injuries) effective January 1, 1994. The legislation required physicians and laboratories to report, and encouraged hospitals to report, certain occupational conditions including serious and preventable farm injuries caused by tractors, farm equipment, and farm machinery. This was an attempt to bring together all reports of all farm injuries in a central location.

D. Project Recognition

In recognition of its many successes, the Farm Injury Project received three prestigious awards. The North Carolina Safety Council presented the Project with the 1996 Citation for Service Award on April 26, 1996 at the annual Home and Community Safety Awards Program in Raleigh, NC. Such awards are given in recognition of those individuals or groups who, during the preceding year, made an outstanding contribution to safety. Program uniqueness, timeliness, magnitude, and success are part of the judging criteria.

The Project received the "Cargill Cares for Farm Families" 1996 Award on June 10, 1996 for its local farm accident prevention programs. Cargill Grain Elevator, based in Minneapolis, MN, donated $1,000 for developing an outstanding farm safety program that helps farm children understand the dangers found on the farm. Because the award must be distributed to the local community, the money was used to help support the 1996 Kids for Farm Safety Day Camp. The Cargill location in Belhaven, NC also matched the corporate donation with another $1,000 to be used for the camp.

Finally, the National Safety Council, Awards and Recognition Committee of the Youth Activities Division, awarded the Farm Injury Project with the Award of Merit (Silver). This was given for the Project's outstanding contribution of programs and/or activities that promote safety and health, save lives, lessen injury, and reduce economic loss. It recognized the Project's efforts to prevent injuries and advance safety and health issues that affect the nation's youth. The award was presented in October 1996.

IV. Lessons Learned

Community involvement and active participation are essential to the success of any surveillance and intervention program.

Physician reporting of farm-related injuries and illnesses was variable. Mandatory reporting of farm injuries is important to communicate the importance of the issue. However, active surveillance of farm-related injuries and illnesses is essential to examining the scope of the problem.

Multiple sources of data are necessary to capture all of the farm injuries and illnesses. Examples of data sources include physicians, hospital emergency room and discharge data, medical examiners' database, migrant health clinics, death certificates, newspaper clippings, etc.

Program and staffing stability is necessary to promote farm health and safety in a more consistent manner.

V. Conclusions

The Farm Injury Project met its goals, achieved the successes it sought, and made significant contributions to improving the health and safety of the agricultural community. The proven successes of the Project have stimulated other communities to request assistance in promoting safety on the farm. The future goal is to preserve and expand activities that are essential to the health and safety of farm workers.

It is difficult to link the decrease in the number of farm injury/illness reports received by the Farm Injury Project to the educational programs implemented by Project staff. In fact, the Project may have increased awareness of farm injuries in the service area and generated more injury reports. It is hoped that, over time, the prevention messages will linger and promote safer work practices.

Funding for the Project ended in September 1996 and staff obtained other positions or pursued other interests. While no state funding exists to sustain this combination surveillance/intervention project, limited surveillance of farm-related injuries and illnesses continues through the occupational disease and injury reporting requirements. The benefits of such a program are many: proven, successful programs can be modeled and implemented statewide; partnerships have been established and will form the basis for future strategic alliances; a data base of farming injuries and illnesses has already been created, providing the basis for effective prevention activities; experienced and credible staff are available for consultation; and equipment, supplies, and educational material have been tested and refined.

VI. Recommendations

Since farming varies from county to county, each new community served should be assessed for its specific needs and the steps to be taken to meet those needs. Timely injury data are essential to identifying important shifts in patterns of farm injuries and recognizing newly emerging problems. Ongoing assessment and surveillance of farm injuries and illnesses are needed on a regional basis for proper development and evaluation of customized interventions. Four priority areas should be addressed: 1) hazards that cause the most fatalities; 2) hazards producing the greatest number of injuries and illnesses; 3) hazards frequently resulting in permanent and serious disabilities; and 4) hazards that cause the most harm to children. The intent is to provide a program that will continue to reduce the number of agricultural injury and illness occurrences. The vision is of a long-term process requiring commitment from the farm community, the public sector, and the private sector.

North Carolina needs a statewide agenda for agricultural safety and health to ensure a commitment to injury and illness prevention among all farm workers. The development of this agenda will result in workable and successful intervention strategies that can be used by public and private agencies; a reduction in the number of deaths, disabilities, and diseases related to farm labor; and improved collaboration with other agencies, organizations, and individuals concerned with improving the health and safety of farm workers. The building blocks of this agenda are present. What is needed now is the mortar to bring the pieces together in an organized manner. The need has been documented and the benefits are many. We share the responsibility to protect and promote the well being of our farming communities.

VII. Acknowledgments

It is only fitting to recognize the hard work of all staff who worked on the Farm Injury Project. Field nurses Bonnie Boyd, RN; Penny Cowan, RN (deceased June 2, 1998); and Maureen Hastings, RN, BSN gave of themselves to accomplish the work of the Project. Coordinators Joan McGuire, RN, MS (1991-1992); Judi Allen, RNC, MPH (1993-1994); and Joyce Reddington, RN, BSN, MSA (1995-1996) worked tirelessly to move the Project forward. Part-time staff Martha Pierce, BS, migrant health technician (1991-1996), and Bill Jones, MPH, RS, public health epidemiologist (1993-1996), and made vast contributions to the work of the Project. With everyone's effort, we were able to make a difference in agricultural health and safety in North Carolina.

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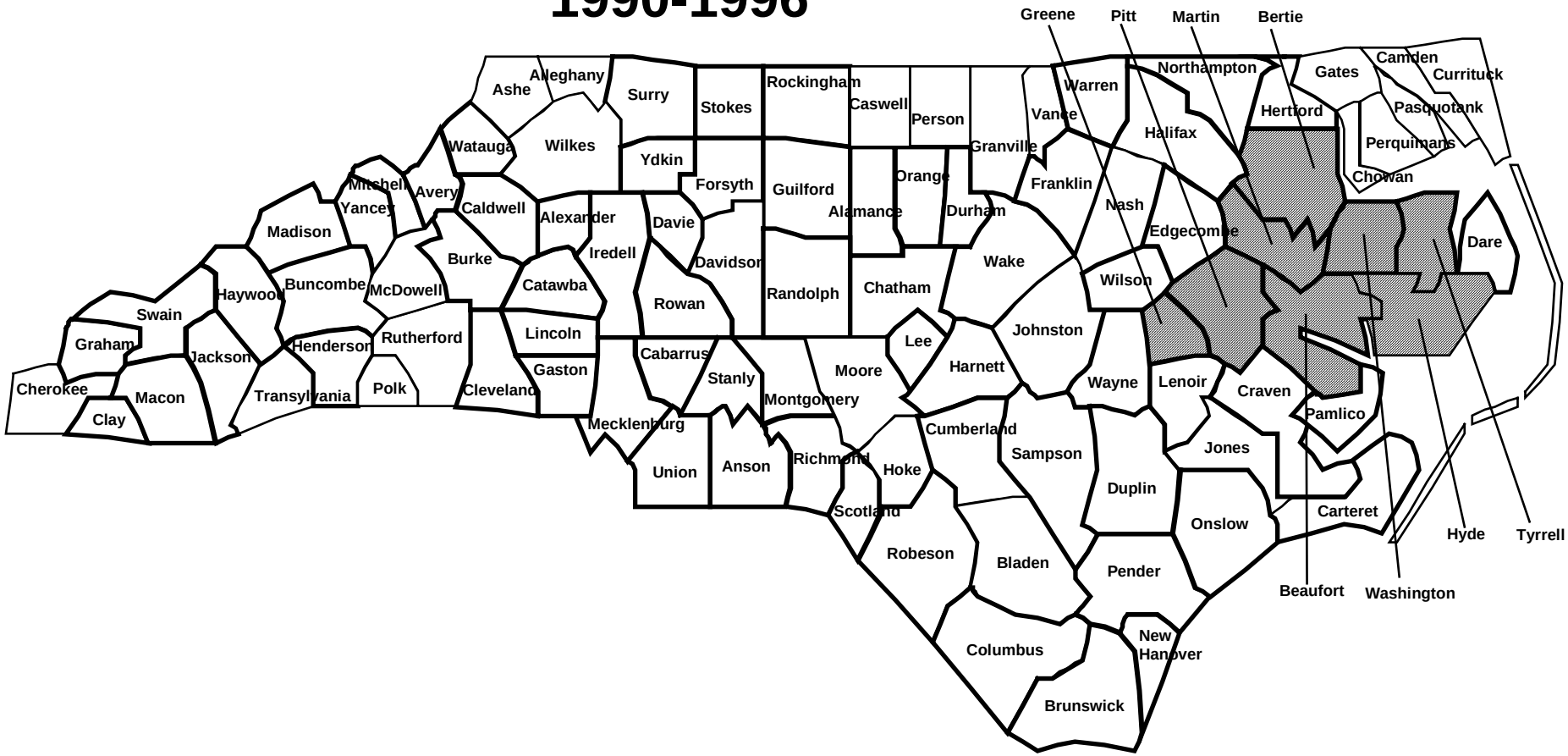
Map 1:
NC Farm Injury Project Location
1990-1996

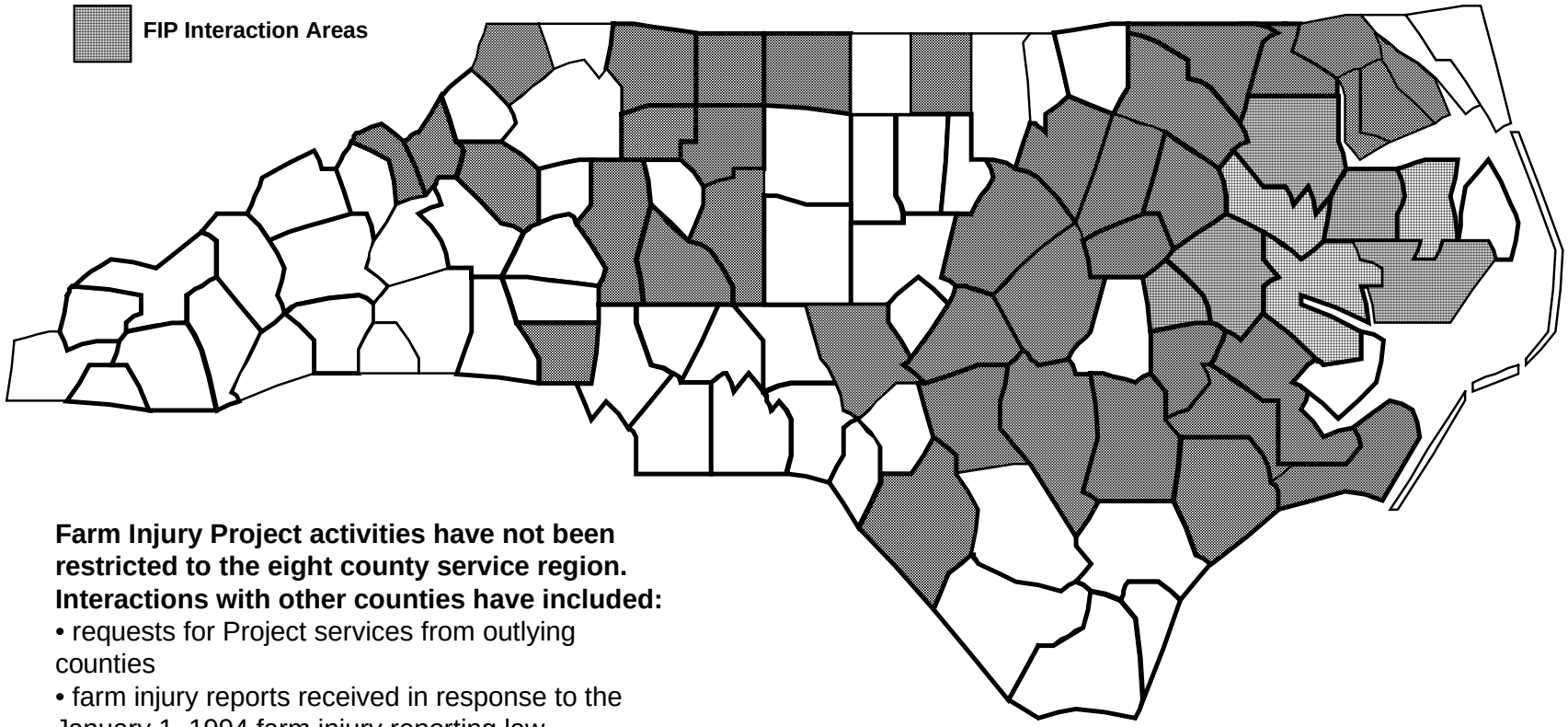


Map 2:
NC Farm Injury Project Outreach Across North Carolina

Legend

FIP Service Area

FIP Interaction Areas



Farm Injury Project activities have not been restricted to the eight county service region. Interactions with other counties have included:

- requests for Project services from outlying counties
- farm injury reports received in response to the January 1, 1994 farm injury reporting law
- out-of-county reports received through Farm Injury Project reporting sources