

**A Proposal for the
North Carolina Agricultural and Rural
Occupational Medicine Program**

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In recent years North Carolina's growth has mainly been in urban and suburban areas. Despite this urban growth, agriculture and rural life still play a large role in the state's economy and its culture. Farming itself has changed significantly over recent years. Agriculture has become more mechanized and dependent upon fertilizers, pesticides and herbicides. Both the more urban focus of the state and the changes in farming have had a negative impact on farmers' health and their access to health care.

There is a growing crisis in the availability of health care services in many rural North Carolina counties. Thirty rural counties have had a decrease in physicians over the past three years. Physicians have gravitated to higher metropolitan incomes. This situation has been accentuated by recent inequities in Medicare and Medicaid reimbursement schemes. In this climate, farmers and agricultural workers are often left with distant health care access without the comprehensive health care and health promotion that they deserve.

Agriculture is now the most dangerous occupation in the United States. It has replaced mining as the occupation with the highest death and disabling injury rate per capita in the 1980s (National Safety Council, 1987). On the other hand, the federal expenditure related to occupational health and safety is exponentially less for agriculture than for mining; 30 cents are spent per agricultural worker per year versus 181 dollars per mine worker per year, while the national average is \$4.34 per worker per year (Purschwitz and Field, 1987). Why are farmers at such high risk and why is so little being done about it? These questions are difficult to answer.

On the state and national level there is no coherent system of collecting data on farm-related injuries and diseases, nor reliable data on hazardous exposures for rural residents, nor a reporting system for occupational illnesses for workers in rural and non-metropolitan areas. Most professionals in the field agree that the present statistics of the National Safety Council most likely underestimate the problem. The information we *do* have is limited to tallies of injuries or deaths without the denominator information for the farm population as a whole. Without this denominator data the risk factors for the high injury and death rates cannot be accurately identified. This need to aggregate data on rural and regional levels has been

recognized as a priority for research (Hersh and VanHook, 1989). Lacking the identification of causative or risk factors it is difficult to design intervention and prevention strategies.

The amount of public funding for research into agriculturally related health problems is minute in comparison to the level of the need. Without an institution devoted to these problems in our state there is little chance to garner any of the funds that *are* available. Lacking such research certainly handicaps the system's response to farmers' high risk of morbidity and mortality.

There exists a locally funded program in western North Carolina and programs have been developed in Iowa, Wisconsin, and New York (Hartye and Mathis, 1989). These represent the first steps toward comprehensive health education programs designed and provided for farmers in this country. Surveys in different parts of the country have shown that farmers want to be informed on the aspects of their work that threaten their health and that of their families (Merchant, et al., 1988; and Hartye and Mathis, 1988). However, they lack the organized representation to bring public and governmental focus upon their safety and health problems.

It is easily apparent to one working in this field that medical professionals are the weakest link in meeting the farmers' health needs. Physicians trained in this state receive little or no exposure to agricultural medicine during their education and training. For this and other reasons physicians often misdiagnose farm-related illness as something else. The medical profession has practically ignored the health education needs of farmers despite the recent trend toward health education of the general population. In a state as agriculturally-based as North Carolina this is an unacceptable situation.

Unless there can be a thoughtful, broad based, and organized approach to data collection, research, and prevention programs, North Carolina will continue to fall short of meeting the safety and health needs of its agricultural population. An agricultural medicine program could bring together the resources of the land grant medical schools, the agricultural schools with their extension programs, the schools of public health, the Area Health Education Centers, the Office of Rural Health Development, the Health Departments, industrial hygienists, and agricultural medicine researchers to work effectively to begin meeting these needs.

Because of the relative neglect that farmers' health has received, there are a number of programmatic needs that must be met early on in the development of a state program. What follows is an attempt to outline a program that begins to meet some of those needs. Hopefully it can provide the groundwork for a public discussion and movement towards meeting farmers' and farm families' health needs.

I. RESEARCH

There are several areas where a coordinated program of research would contribute significantly to our understanding of problems of rural occupations.

A. Surveillance/detection of farm injury and illness.

Presently, there is no coherent system of collecting farm health data. National data lumps fishing and logging in with farm work. There is no collection center which physicians use to report farm injury and disease data. At a minimum the State of North Carolina, through its universities and public health system, should institute a data collection system that meets the following standards:

1. Defines a set of categories of farm health information to be uniformly collected by those working with farmers.
2. Is comprehensively applied through local hospitals, Public Health Departments, medical societies, and industries and firms who report injuries through workman's compensation.
3. Is able to publicize the necessity for data collection on a regular basis in order to motivate consistent local use of the system.
4. Monitors data collection and processing of the data.
5. Designs more intensive data collection in areas that indicate high need (e.g., if tractor fatalities are high in a certain region then gather more information to help determine why).
6. Designs interventions in areas of high need based on the data collected and works with others in the system to implement those interventions while continuing to monitor the effect of intervention.
7. Sets standards for more precise geographical coding in patient medical records of patient residence and workplace to assist in epidemiological studies.

B. Definitive or basic research.

This category of research would look into the specific mechanisms of agriculturally related injuries and illnesses as well as the detection of previously undocumented illnesses related to farm work. It would involve the networking of researchers in the medical centers with medical providers, extension agents, and school systems in the local communities.

Below are some potential areas of research pertinent to North Carolina. These projects represent areas where there is a need for basic epidemiological studies to document the existence of suspected problems, and a need for more applied research into the efficacy of some proposed solutions. More thorough discussion of these areas and our current knowledge can be found elsewhere (Donham and Horvath, 1987).

1. Lung problems associated with chicken confinement house work; both by the regular workers and the catchers.
2. Hearing loss due to chronic exposure to farm machinery noise.
3. Development of usable equipment to protect the farmer in the chicken houses.
4. Degenerative hip and back problems from chronic vibratory exposure in tractor work and possible ways to prevent them.
5. Farmer, farm family, and farm worker access to care and related health policy issues; dovetailing with the NC Office of Rural Health Services in this area.
6. Defining factors that cause certain illnesses to be more common in farmers, such as heart disease, lymphoma, suicides, etc.
7. Determining effectiveness and usability of protective clothing in pesticide use.
8. Delineation of skin problems in agriculture and methods of prevention such as the use of sun blocks.

9. Relationship of pesticide and nitrate groundwater contamination to health problems in farm communities. Our lack of basic knowledge in this area has prompted the AMA Council on Scientific Affairs to issue a caution to physicians regarding the potential carcinogenicity of pesticides used in the U.S. (Council Report, 1988).

C. Prevention Research

Prevention offers the first obvious solution to many rural occupational problems, yet we know very little about the mechanisms involved in changing behavior in this population and the potential efficacy of prevention programs (Davis JB, et al., 1988). Basic fundamental steps that should be taken include:

1. Providing study and research design guidance to existing programs to help them understand their impacts; and
2. Monitoring the effectiveness of prevention programs on targeted negative outcomes including the conditions mentioned above.

II. EDUCATION

A. Farmers' health education

A comprehensive health and safety education system should be developed that will provide materials flexible enough to meet the needs of varying types of farming in different parts of the State. This system should also provide for a network which works in conjunction with medical schools, community health centers, local medical societies, and the Extension Service to reach the farmers and agricultural workers on a local level. This network would also serve to provide input to a state center on the health needs of farmers and farmworkers. This could be cross-referenced to give an indication of whether the official data collection system was functioning properly.

B. Farm safety education

Presently there is a state level safety specialist with the Extension Service. Using the networking described above and the expertise of the safety specialist, the proposed center could develop a farm safety checkup service for local farmers geared toward injury and exposure protection. Land grant colleges offering an A.A.S. or B.S.

degree in agriculture should require a course in agricultural health and safety as part of those degree curricula.

C. Agricultural medicine education for medical personnel

1. Medical schools: develop a curriculum pertinent to the regional farming needs, probably beginning as a two-week didactic curriculum with the goal of developing a four-week didactic plus clinical rotation in the state medical schools. This would be coordinated with the family medicine, community medicine, internal medicine, pediatrics and surgery departments.

2. Residency programs: for family medicine and combined medicine and pediatric residencies—develop curriculum and clinical experience in rural preceptor sites in conjunction with the North Carolina AHEC program.

- emergency medicine residency—include agricultural injuries and pesticide poisonings in the curriculum.
- occupational medicine programs—develop a rotation at the Ag medicine center.

3. FNP/PA programs: develop curriculum materials for elective course for those planning to work in a rural area.

D. Education for teachers and students

1. Curriculum for teachers and an example program on farmers' health to include in the course for their students at different age levels (e.g., the Ontario program).

2. Development of programs to fit into 4H camps, especially on safety issues. The fundamentals of prevention and health promotion specific to farming and rural life would be the focus of programs.

E. Education for public and private health personnel working in rural counties

1. Continuing education programs on agricultural medicine and the constraints of rural practice for physicians in rural counties.

2. Education of medical professionals working with farm families to keep abreast of the development of safe alternatives to modes of production presently causing illness in their farming patients.

F. Agricultural extension agent education

Agricultural extension agent education in agricultural medicine in order for them to dovetail better with rural medical providers on the detection of farm-related injury and illness.

III. SERVICES

A. Referral and consultation center staffed with professionals with expertise in the area of agricultural medicine for assessment and treatment of the more difficult agriculturally related injuries, illnesses, and exposures.

B. Development of an extension program of the poison control network to increase its use by farmers improperly exposed to pesticides or other agrichemicals.

C. Consultation to the legislative and executive branches of state government on issues related to farmers' health.

D. Work with the NC Office of Rural Health Development on farm family access to care based on research in this area as outlined above.

This outline serves to open the discussion on what an Agricultural and Rural Occupational Medicine Program in North Carolina should be. Hopefully there can be a coalition of those who serve farmers that advances the development of such a program in our state in the very near future, and then remains involved enough to ensure the quality of that program once it begins.

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