



***EYE ON FARMWORKER HEALTH:  
CURRENT DEVELOPMENTS IN RESEARCH AND POLICY***  
(FORMERLY FJ EYEOPENER)

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*Welcome to Farmworker Justice's electronic newsletter covering recent developments in health-related research and policy relevant to migrant farmworkers in the US. Please feel free to send comments, questions, or suggestions for future issues to the address provided at the end of the newsletter. A PDF version of this newsletter is available at <http://www.farmworkerjustice.org/Health&Safety/resources1.htm>.*

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**Table of Contents:**

- 1. High rates of skin disease emphasize need for improved workplace protections for farmworkers**
- 2. Occupational stress and farmworkers' health-related quality of life**
- 3. Study identifies potential link between pesticide exposure and long-term health effects**

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**1. High rates of skin disease emphasize need for improved workplace protections for farmworkers**

Vallejos QM, Schulz MR, Quandt SA, Feldman SR, Galvan L, Verma A, Fleischer AB, Rapp SR, Arcury TA (2008). Self report of skin problems among farmworkers in North Carolina. *American Journal of Industrial Medicine* 51(3): 204-212.

The agricultural setting exposes farmworkers to numerous substances that can cause allergies and irritation to the skin, including pesticides and other chemicals, petroleum products, and plants and animals. As a result, farmworkers in the US have high rates of skin diseases or disorders compared workers in other industries, such as construction and manufacturing. This high prevalence of skin problems is an issue for farmworkers because they can interfere with work and lower health-related quality of life. And since farmworkers have limited access to health care, they often are unable to effectively prevent and treat skin problems. Most studies to date are based on long-term recall or physician-diagnosed incidents, so the reported rates probably understate the true situation.

To address this gap, researchers in North Carolina interviewed workers about their experiences with skin problems in a series of interviews designed to assess rates based on short-term recall and identify likely risk factors. A total 304 farmworkers, mostly male, were asked whether they had experienced any of 13 skin problems in the two weeks preceding the interview, as well as questions about their work and living environments that might contribute to skin problems. These interviews were repeated once a month for five months during the agricultural season. Commonly reported skin problems included skin and nail fungus, sunburn, calluses, itching, and rashes. While not necessarily life-threatening, the high incidence of these draws attention to a number of work-related issues for farmworkers:

- Workers should wear long sleeves, gloves, good boots, and other protective equipment to reduce contact dermatitis, rashes and itching
- However, some protective equipment, such as rain suits, may actually contribute to skin problems
- Wet clothes and shoes may also contribute to itching and rashes, as well as increase exposure to pesticides and the risk of green tobacco sickness (transdermal nicotine poisoning from contact with wet tobacco leaves)\*
- The high incidence of sunburn indicates the importance of workers protecting themselves from excessive sun exposure, which can lead to serious and potentially deadly heat illness
- Many workers live in communal housing, which can increase the risk of spreading the fungal and viral infections associated with skin diseases

Heat protection, protective equipment, and better housing are all issues that can and should be addressed through patient education and improved workplace conditions. Any steps taken to reduce the rates of skin disease are likely to have many collateral benefits for farmworkers.

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\* Quandt SA, Arcury TA, Preisser JS, Norton D, Austin C (2000) Migrant Farmworkers and Green Tobacco Sickness: New Issues for an Understudied Disease. *American Journal of Industrial Medicine* 37:307 – 315.

## **2. Occupational stress and farmworkers' health-related quality of life**

Grzywacz JG, Quandt SA, Arcury TA. Immigrant Farmworkers' Health-related Quality of Life: An Application of the Job Demands-Control Model. *Journal of Agricultural Safety and Health* 14(1):79-92.

Occupational psychologists have found that high levels of occupational stress have been linked to poorer physical and mental health among workers in many industries. Since farmwork is characterized by a large number of potential stressors, e.g., repetitive and demanding physical tasks, irregular hours and income, harsh working conditions, it seems likely that farmworkers may be at risk for poorer health linked to occupational stress. For a number of reasons, farmworkers tend to be left out of the development of models of work-related health issues. It has therefore not been documented whether farmwork is a high stress occupation, and if so, whether it affects workers' physical or mental health. One model for assessing job stress used by occupational psychologists looks at two dimensions of the work situation, demand and control. Simply stated, the model postulates that jobs that are "high demand" (i.e., characterized by many stressors) and / or "low control" (i.e., limit workers' autonomy and choices) have been associated with higher levels of occupational stress, which would then be linked with poorer health outcomes. Researchers in North Carolina tested this model with 151 farmworkers by

interviewing them about the content and characteristics of the work (i.e., indicators of demand and control), and measuring mental and physical health-related quality of life. The interviews drew from standardized questionnaires that were modified to make them more culturally- and educationally-appropriate for the largely Latino, Spanish-speaking study population.

The results indicated that the model did not apply as well to farmworkers as compared to workers in different industries in other studies. The only “demand” stressor associated with poorer physical health-related quality of life was isometric load (maintaining awkward postures for long periods of time). None of the other demand indicators, such as fast pace or extreme physical exertion, were associated. Greater decision authority (a “control” indicator) was associated with better mental health-related quality of life scores, but had no effect on the physical or overall health-related quality of life. These results make sense in light of earlier research that found immigrant Latino farmworkers tend to be more focused on financial security for their families than on whether or not their jobs are stressful. Therefore, the *absence* of work was more stressful than demanding or low-control jobs: any job may be preferable to no job.\*

The finding that health-related quality of life was not strongly affected by high stress work may mean that the model needs to be adjusted (as suggested by the study’s authors). Nonetheless, the two individual findings – that isometric load was associated with poorer health and that decision authority was associated with better health – provide support for efforts to improve farmworkers’ rights in the workplace and advocate for better physical working conditions.

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\*Grzywacz JG, Arcury TA, Marín A, et al. (2007). Work-family conflict: Experiences and health implications among immigrant Latinos. *Journal of Applied Psychology* 92(4):1119-1130.

### **3. Study identifies potential link between pesticide exposure and long-term health effects**

Muniz JF, McCauley L, Scherer J, Lasarev M, Koshy M, Kow YW, Nazar-Stewart V, Kisby GE (2008). Biomarkers of oxidative stress and DNA damage in agricultural workers: A pilot study. *Toxicology and Applied Pharmacology* 227: 97-107.

One of the challenges facing researchers attempting to understand the association between pesticide exposure and the development of diseases such as cancer, Parkinson’s, and other neurological diseases is the lack of scientific certainty about the biological mechanisms linking exposure to those health outcomes. To date, most studies have relied on self-reports of exposure that may have occurred years or even decades earlier, making it difficult to connect the two events. Identifying a measureable biological outcome of pesticide exposure that is also known to be associated with the development of disease later in life would be an important step towards linking exposure and health outcomes. One possibility is that pesticide exposure may contribute to DNA damage through a process known as oxidative stress, which disrupts the body’s ability to repair damage at the cellular level. Oxidative stress has been implicated in a number of diseases, including those that are believed to be caused by pesticide exposure. Researchers in Oregon undertook a study with farmworkers to see if they could find an association between exposure to organophosphate (OP) pesticides and oxidative stress and DNA damage.

The study included 12 pesticide applicators, 10 farmworkers, and nine individuals for a non-exposed referent group who lived in an urban area and had never worked in agriculture. Participants provided blood and urine samples and completed questionnaires about their work activities, exposure history, and personal factors that may affect oxidation, such as smoking and diet. The urine samples were tested for pesticide metabolite concentrations, which are measures of exposure to OPs. Both blood and urine samples were analyzed for evidence of oxidative stress and DNA damage. These data were then compared with the information on pesticide exposure, work activities, location of residence, and personal factors. Workers who had been exposed to pesticides had higher levels of indicators of oxidative stress and DNA damage than those who had not been exposed. Furthermore, higher levels of pesticide exposure were correlated with more damage, indicating a dose-dependent association. Comparison of these findings to results of earlier *in vitro* studies of oxidative stress and exposure to azinphos methyl (AZM), a common pesticide in Oregon, suggest that the damage measured in the workers in this study was due to exposure to AZM.

These findings are an important contribution to ongoing efforts to understand how pesticide exposure affects health outcomes, especially the long-term effects, such as cancer. Farmworker Justice is a partner in a new study in Oregon that expands this work to farmworkers from indigenous language speaking areas of Mexico and Guatemala, and tests the use of a non-invasive technique for measuring oxidative stress. Updates will be included in future issues of *Eye on Farmworker Health*.

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***Eye on Farmworker Health: Current Developments in Research and Policy*** is an electronic newsletter covering important recent developments in research and regulation on issues affecting the health and safety of migrant farmworkers. It is a joint project of Farmworker Justice and Migrant Clinicians Network, supported by the Health Resources and Services Administration's Bureau of Primary Health Care. Each issue includes summaries of recent articles and reports, as well as recommendations for using the information to help health professionals, outreach workers, *promotores de salud*, and advocates strengthen their efforts on behalf of farmworkers and their families.

*The contents of this publication are solely the responsibility of Farmworker Justice and Migrant Clinicians Network and do not necessarily reflect the official views of the Bureau of Primary Health Care or the Health Resources and Services Administration.*

Please send comments, questions or suggestions for topics you would like to see covered to Pamela Rao, editor, at [prao@farmworkerjustice.org](mailto:prao@farmworkerjustice.org), or call 202-293-5420, ext 310.

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