

FARMWORKER JUSTICE

HEALTH POLICY BULLETIN

Policy in action to educate and protect agricultural workers from pesticide exposure

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Spring 2016

Revisions to the Worker Protection Standard: Increased Safety for Agricultural Workers

Pesticide exposure can result in short-term health effects such as nausea, dizziness, and seizures as well as long-term health effects such as birth defects, asthma, and cancer. Agricultural workers are routinely exposed to high levels of pesticides in the fields where they work and in the communities where they live. Their persistent exposure to pesticides has resulted in an average of 57.6 out of every 100,000 agricultural workers reporting acute pesticide poisoning, illness or injury each year.¹ The Environmental Protection Agency (EPA) estimates that up to 3,000 acute pesticide exposure incidents occur every year.² These numbers exclude the many workers who suffer chronic health problems as a result of pesticide exposures, and do not factor in the known under-reporting of pesticide poisonings and illnesses.

The EPA's Worker Protection Standard (WPS) provides basic workplace protections to agricultural workers and pesticide handlers to minimize the adverse effects of pesticide exposure. Last updated in 1992, the EPA published major revisions to the WPS in November 2015. The revised WPS establishes a minimum age of 18 for pesticide handlers; increases the frequency of worker safety training content from once every five years to every year; improves the content and quality of worker safety trainings; provides new rules on decontamination and personal protective equipment; and improves the quality of information that workers receive about the pesticides that have been applied at their workplace.

The improved regulations should result in greater awareness by agricultural workers of the risks they face. It will also provide better protections for workers from pesticide exposure. Health centers need to understand the WPS revisions so they can better attend to their agricultural worker patients. In the coming months, we will provide more materials and trainings on the WPS revisions and its impact on agricultural workers. We will also work with agricultural worker communities and the EPA to ensure timely implementation and strong enforcement of the new rule.

Agricultural workers deserve to be able to work without the fear of exposure to pesticides or other hazardous chemicals. The revised WPS is an important step forward towards achieving that goal.

¹ Geoffrey M. Calvert et al., Acute Pesticide Poisoning Among Agricultural Workers in the United States, 1998 – 2005, 51 AM. J. INDUS. MED. 883, 890 (2008).

² 80 Federal Register 211 (November 2, 2015), p. 67502.

WHAT'S INSIDE

Revisions to the Worker Protection Standard	1
Lessons Learned: Pesticide Education of Agricultural Workers in Ontario, Canada	2
Promoting Health and Safety Using Mobile Technology	4
Eye on Farmworker Health	5

Upcoming Webinar - Protecting Farmworkers: Revised U.S. Environmental Protection Agency's (EPA) Worker Protection Standard

Date: Wednesday, April 13, 2016

Time: 1pm – 2pm ET

The webinar will address the recently revised WPS. FJ and MCN will provide participants with resources to help educate agricultural workers and their families about pesticide exposure and to assist clinicians in the recognition and management of pesticide exposure.

View more information and register for this webinar at this link

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Lessons Learned: Pesticide Education of Agricultural Workers in Ontario, Canada

Eduardo Huesca, Migrant Farmworker Program Coordinator, Occupational Health Clinics for Ontario Workers



Pesticide exposure continues to be a high hazard in conventional agricultural production. Exposure to pesticides can cause acute health effects, such as skin, eye and respiratory irritation as well as acute poisoning which may be lethal. Chronic effects may also occur including neurological effects, endocrine impact and some forms of cancer.

The Occupational Health Clinics for Ontario Workers (OHCOW) runs mobile occupational health clinics for agricultural workers across the Canadian province of Ontario, and provides prevention-based occupational health and safety resources and educational materials. Through our clinics we have seen agricultural workers presenting with symptoms associated with low level pesticide exposure, and have heard of cases of higher level exposure incidents among agricultural workers that we are working to quantify more clearly. These clinical experiences and cases have motivated us to work to better understand the pesticide-related concerns and experiences of agricultural workers, and seek ways to better support safety when working with and around pesticides.

During the 2014 and 2015 agricultural season, we conducted a series of consultations with agricultural workers, ranging from informal conversations during our clinics and workshops to more formalized interviews, to gain a better sense of their issues and concerns. The findings of these consultations identified that most workers had not received information, education, or training on pesticide safety, and that even some working directly with pesticides, taking on loading, mixing and spraying roles, felt as though they did not fully understand safety requirements. Many workers identified having experienced health concerns and symptoms related to pesticide exposure. Many workers also conveyed that they were anxious and uneasy about not knowing what was being sprayed at their worksite and not being informed about safety precautions. Therefore, they did not fully know how or if their health was being affected by the use of these substances. The majority of workers we spoke with also expressed an interest in knowing whether they should be using personal protective equipment such as gloves or masks while working in fields sprayed with pesticides. They had not received any information of whether

continued to page 3

they should consider these protective measures. Other workers said they did not have access to good functioning laundering facilities at their employer-provided housing, or had to share facilities among many coworkers, making it difficult to regularly launder work clothes that may have been exposed to pesticide residues.

In looking further into pesticide-related regulation within the jurisdiction of Ontario, Canada, we identified various gaps. Pesticide training and certification initiatives in the province of Ontario have to date focused on pesticide vendors, handlers and sprayers. However, provincial sprayer certification training has not been available in Spanish or any of the other languages spoken by many migrant agricultural workers. This was recognized as a serious and dangerous gap as non-English speaking agricultural workers are involved in pesticide spraying across the province. Therefore, the mandated training to ensure that workers understand how to load, mix and spray pesticides safely has not been accessible to them because it does not meet their language needs.

In addition, current provincial training and educational initiatives have to date excluded agricultural workers who are not directly handling pesticides, even though they still face the risk of being exposed to pesticides by working in close proximity to them. Therefore, important pesticide safety information, such as restricted entry intervals, spraying announcement and posting protocols, protocols on pesticide drift, as well as best practices such as regular washing and clothes laundering, avoiding pesticide storage areas, and not reusing pesticide containers among others, are not reaching most workers.

In partnership with the Ontario Pesticide Education Program (OPEP), the office that develops and runs provincial pesticide training and certification, we were able to move forward on an initiative that has trained Spanish speakers in major agricultural regions of the province to provide the mandatory pesticide sprayer training in Spanish. We have also translated a series of pesticide safety posters developed by OPEP into Spanish. In addition we have increased awareness of pesticide safety of agricultural workers (non-sprayers), and in collaboration with OPEP we are in the process of developing a pesticide safety course for non-sprayers/ agricultural workers that will be available in Spanish. We plan to train workers across the province starting in the 2017 season.

In our work we have been very inspired by the recent issuing of stronger pesticide safety protections for agricultural workers by the EPA, and by the great work of agricultural workers, health centers, support networks and advocates across the United States. We hope to continue to develop collaborative connections and partnerships to better learn from the U.S. experience. Our pesti-

cide-related educational resources and training guides will be on our website in early 2016, along with our other free resources, for others to browse and determine whether materials are useful and relevant for regional contexts. We also share the recommendation for community health centers and clinics working with agricultural workers to talk with these communities about their experiences and concerns with pesticides, whether informally or more systematically through accessible clinic questionnaires or interviews of focus groups. Through this work, we can better assess whether existing legislation and interventions are having real impacts for agricultural workers on the ground, while also having workers identify additional areas of needed support.

There is still quite a lot of work to do. We still continue to look for more Spanish speakers interested in becoming pesticide safety trainers to ensure mandatory sprayer training is widely available in Spanish across agricultural regions of the province. We are also working to identify other languages spoken by agricultural workers in Ontario, and build capacity to provide training in these languages. Although the educational focus on non-sprayer pesticide safety is a great achievement, this focus is not reflected in legislation, and until it is, this training will not be a requirement nor will workplace safety measures that more thoroughly consider the safety of non-sprayer/ agricultural workers. Including all agricultural workers in pesticide safety training is a best practice towards ensuring all workplace parties are knowledgeable on pesticide hazards and safety measures, and can understand, adhere, contribute to, and strengthen workplace pesticide safety programs and protocols.

For more information, contact:

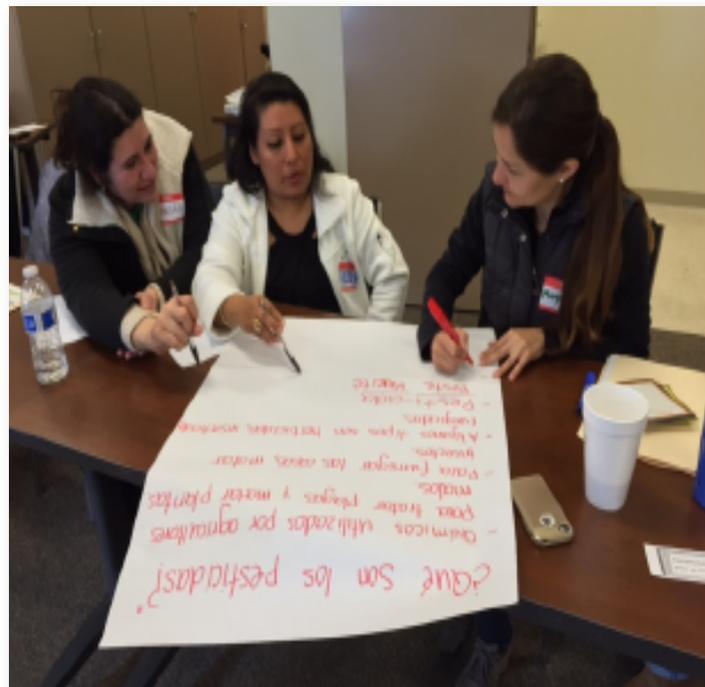
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With the support of other OHCOW-Hamilton Staff

Promoting Health and Safety Using Mobile Technology

Chelly Richards, Project Manager, Community Engagement & Health Promotion, Farmworker Justice

Agricultural workers account for less than 1% of the total U.S. workforce yet they suffer 12% of all fatal on-the-job injuries. Thousands of agricultural workers are poisoned every year through occupational exposure to pesticides. Exposure occurs through pesticide spray, drift, residues in the soil and on foliage, from spills and splashes during application, and due to the lack or improper use of personal protective equipment. Studies in California, Washington, and North Carolina found agricultural pesticides in nearly all agricultural worker homes, as well as in their children's urine at rates higher than the general population. Although pesticide safety training is currently required for all workers engaged for more than five days in hand labor in treated fields, a North Carolina study revealed that 57% of workers had not received pesticide safety training.



For the last five years, Farmworker Justice has partnered with *promotores de salud* in community-based organizations to carry out educational programs on occupational safety and health. In 2015, Farmworker Justice partnered with *Lideres Campesinas* in California to train 19 *promotores* from three different regions. In the six months after receiving training, they reached over 2800 agricultural workers with information to help them protect their health while on the job. This year we added a text-messaging component to reinforce the health messages received by participants. We worked with Iana Simeonov, a researcher and consultant, to design and implement the text messaging program.

In her preliminary research, Ms. Simeonov found that almost all agricultural workers own mobile phones and the majority have unlimited usage plans and use mobile technology to access the internet. She found that mobile technology serves as workers' primary means of communication with family members in other countries and found that text messaging programs work well to distribute information to workers. Text messages are also an effective method for providing follow up information to an otherwise hard to reach and mobile population. Other organizations have developed text messaging programs to educate agricultural workers about diabetes and women's health, to increase access to health care, and to inform workers about their rights. Text messaging has also been used to collect data for health research involving agricultural workers.

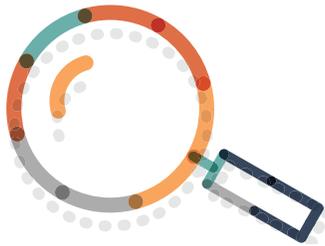
Looking ahead, text messaging and mobile applications can help agricultural workers receive information about their health and safety, their rights, and available community resources such as migrant head start sites and community health centers. Also, mobile technology can help researchers collect data about agricultural worker demographics, including their health, housing, and other social determinants that affect their health and well-being.

With the new text messaging program, *promotores* at *Lideres Campesinas* are able to enroll workers so they continue to receive information on work safety, injury prevention, and their legal rights for several months after the in-person training using their cell phones. The workers enrolled in this program also receive questions to evaluate the program and to solicit information about their experiences with safety at work. Farmworker Justice hopes to expand its use of mobile technology to improve communication with workers and ensure that projects and policies are responsive to the needs of the community.

For more information about FJ's current mobile technology work, contact Chelly Richards at crichards@farmworkerjustice.org.

EYE ON FARMWORKER HEALTH

Eye on Farmworker Health is a summary of important recent developments in research on issues affecting the health and safety of agricultural workers. Previously a standalone quarterly e-newsletter, Eye on Farmworker Health is now part of FJ's Health Policy Bulletin. Previous issues of Eye on Farmworker Health can be found on Farmworker Justice's website.



EYE ON FARMWORKER HEALTH:

A Review of Non-occupational Pathways for Pesticide Exposure in Women Living in Agricultural Areas

Authors: N Deziel, M Friesen, J Hoppin, C Hines, K Thomas, L Freeman

Source: Environmental Health Perspective (2015) 123: 6

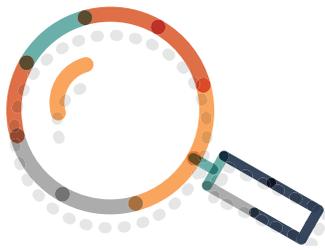
Relative to urban women, women living in rural areas are more likely to experience high pesticide exposure due to non-occupational pesticide exposure pathways. Understanding exposure to pesticide pathways among women in non-occupational settings is critical to a better understanding and evaluation of pesticide-related health risks among women. This literature review identifies important pathways and gaps in the literature through consideration of all published reports of non-occupational pesticide exposure in women living in agricultural areas in North America.

The authors used numerous databases, including PubMed, Scopus, Web of Science, and Google Scholar to identify relevant studies. Thirty-five publications were included in the literature review. The authors searched for non-occupational exposure pathways articles pertaining to: take-home exposure (referred to by the authors as para-occupational exposure) such as pesticide residues on clothing, shoes and skin of family members who work in agriculture, agricultural drift, residential pesticide use, and dietary ingestion, as well as the role of hygiene factors.

Overall, the authors found reasonably consistent evidence that take-home exposure and agricultural drift pathways contributed to pesticide exposure in women. The authors only found moderate evidence that suggested an association between residential pesticide use and pesticide concentrations in dust in homes in agricultural areas. There was also limited support regarding the association between pesticide levels in dust and hygiene factors, such as laundry practices, shoe/clothing removal, and pets. The authors write that many of the studies they analyzed were not focused on hygiene factors, had limited power to evaluate hygienic practices, and incorporated questions that were either subjective or were asked differently across studies.

The authors raise a number of challenges that they believe warrant consideration in the interpretation of the findings of this literature review. Most importantly, because agricultural populations are exposed to pesticides via multiple concurrent pathways, it remains difficult to determine relative exposure from each of these pathways. Also, few studies had dust and biological samples in the same population, so inconsistencies could be attributable to any of the many factors that differed among the studies (for example geographic location, study time period, etc.). Most studies measured only a few pesticides, leaving out many commonly used active pesticide ingredients. Further, many women living on farms personally handle pesticides but the review did not focus on occupational pathways. Also, because the studies were concentrated in certain geographical areas with distinct crop types, the analysis may not be generalizable to all agricultural areas. Finally, the authors identify a possible publication bias in their selection of studies.

Throughout the review, the authors provide recommendations to strengthen the understanding of take-home exposure in women living in agricultural areas through future studies. Some of these recommendations are: more specific questions about residential pest treatments in larger study populations; more studies on food and drinking water-based exposure in agricultural populations; and further investigation into the effectiveness of recommended hygienic practices in the reduction of pesticide levels in the home. The authors also recommend that future research include women with a greater variability in pesticide contact. They believe that an improved understanding of the pathways of pesticide exposure in women is critical for future epidemiologic and exposure studies as well as the design of effective risk mitigation strategies in agricultural communities.



EYE ON FARMWORKER HEALTH:

Longitudinal Assessment of Blood Cholinesterase Activities Over 2 Consecutive Years among Latino Nonfarmworkers and Pesticide-Exposed Farmworkers in North Carolina

Authors: S Quandt, C Pope, H Chen, P Summers, T Arcury

Source: *Journal of Occupational Health* (2015) 57 (8): 851-857

While pesticide handlers face the highest risk for exposure and immediate health effects, field workers are also at risk through drift and exposure to pesticide residues. The close proximity of housing to the fields and the substandard conditions of that housing create additional pathways to exposure. Despite measures to reduce pesticide exposure, studies of pesticide metabolites in U.S. farmworkers suggests that a significant number are still exposed to cholinesterase-inhibiting pesticides that put farmworkers at risk for neurotoxic effects and may be linked to neurodegenerative diseases and birth defects. The objectives of this study are: 1) describe patterns of whole blood total cholinesterase across the agricultural season by comparing farmworkers and nonfarmworkers; and 2) explore the differences between farmworkers' and non-farmworkers' likelihood of cholinesterase depression across the agricultural season.

The data collection was part of an ongoing community-based participatory research program "CBPR on Pesticide Exposure & Neurological Outcomes for Latinos." All the participants identified as Hispanic or Latino. The farmworker participants were recruited in east central North Carolina and had worked in agriculture for at least three years. The vast majority (95.2%) were farmworkers in the U.S. on temporary H-2A work visas. The nonfarmworker participants, the control group, were recruited in Forsyth County in west central North Carolina and had not been employed in pesticide-exposing jobs (agriculture, forestry, lawn maintenance, etc.) for the past three years. The data was collected through interviews and blood samples that were collected eight times across two agricultural seasons in 2012 and 2013. The differences in cholinesterase, acetylcholinesterase and butyrylcholinesterase activity were measured using a linear mixed-effects model approach to account for the repeated measures across the four different months in a two year period. The depression of cholinesterase was marked as a change 15% or more from an individual's yearly maximum value.

The data supported that the patterns of cholinesterase activities among farmworkers reflect occupational exposures. In comparison to nonfarmworkers, farmworkers had significantly lower total cholinesterase

and butyrylcholinesterase activities in July and August and significantly lower acetylcholinesterase activity in August. Within farmworkers, all months were significantly different from each other for butyrylcholinesterase activity. The acetylcholinesterase activity for farmworkers in June was different from each other month. There was a significant difference in total acetylcholinesterase activities for nonfarmworkers between July and August and between August and September. The authors found no significant difference in butyrylcholinesterase activity for nonfarmworkers.

The authors found that farmworkers had nearly four times greater odds of depressed cholinesterase activity in August and one and a half times greater odds overall compared to nonfarmworkers. The differences were less apparent overall but still significant. For acetylcholinesterase, the pattern was the same and reached significance in September in the unadjusted model. For butyrylcholinesterase, farmworkers had twofold greater odds in July and threefold greater odds in August of depressed cholinesterase and more than one and a half times greater odds overall, which remained significant after adjusting for recent residential pesticide exposure. August had the highest odds ratio for each cholinesterase activity even when residential exposures were included in the model.

Few studies of cholinesterase activities in agricultural workers included a control group. The results of the study reflect the authors' intended differences in pesticide exposure between the two groups that are reflected in their reports of work and living environments. Despite the measures mandated by the Worker Protection Standard (WPS), the results of the study show that nonapplicator farmworkers are still being exposed to pesticides. The authors note that these results are supported by other studies of U.S. farmworker populations documenting pesticide exposure through the use of biomarkers as well as studies that provide evidence of the lack of compliance by growers of the WPS.

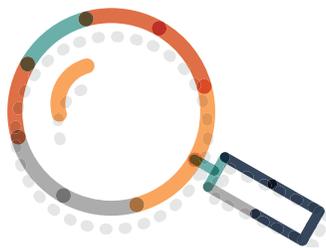
The authors acknowledge several limitations to the study. First, the pesticides used by the farmworkers in the study may be different from those used in other parts of the country with different crops. Second, the

continued to page 7

lack of baseline values may have led to some misclassification of cholinesterase activity reductions. Third, while the threshold of 15% is a generally accepted threshold value for classifying cholinesterase activity reduction, the authors point out that it may have resulted in some false positives. Finally, there was no available data, such as pesticide application records or biomarker assessments, to confirm pesticide exposure.

The primary strength of the study is its design, which included a control group who resided in a nonagricultural area and repeated measures of cholinesterase activities over two growing seasons. Further, the authors used a radiometric method to measure cholinesterase activities rather than the Ellman method. While the Ellman method is the most common approach to the evaluation of cholinesterase activity, the authors believe that the radiometric method is more likely to minimize the reactivation of carbamate-inhibited cholinesterases.

The study shows that farmworkers continue to be exposed to neurotoxic cholinesterase-inhibiting pesticides. Even low-levels of exposure may place workers at risk for negative future health consequences. The authors conclude that the results indicate the need for additional measures to ensure farmworkers' workplace safety.



EYE ON FARMWORKER HEALTH:

Perceptions of Housing Conditions among Migrant Farmworkers and their Families: Implications for Health, Safety, and Social Policy

Authors: J Keim-Malpass, C Spears Johnson, S Quandt, T Arcury
Source: Rural and Remote Health (2015) 15: 3076. (Online)

For a majority of migrant farmworkers, housing is directly linked to employment, which is sometimes included in their compensation. Farmworker housing is regulated by the Migrant and Seasonal Agricultural Worker Protection Act (also referred to as MSPA or AWP) that creates standards for living and sleeping spaces, general safety, and sanitation. States have jurisdiction over enforcement of these regulations. The study's purpose is to understand the experiences and perceptions of migrant farmworkers concerning their housing and its potential impact on health and safety. Though themes such as safety, pests, water supply, and air quality are discussed in the study, this summary will focus on farmworkers' exposure to pesticides and the supplemental housing risks it poses.

The authors worked with the North Carolina Farmworkers Project and Student Action with Farmworkers to recruit 30 farmworkers from across North Carolina. They purposely recruited farmworkers in diverse housing situations; participants lived in houses (17%), trailers (60%) or barracks (23%) with 23% classifying their housing quality as good, 47% as average, and 30% as poor. The majority of participants in the study were male (70%). Participants included unaccompanied men both with and without H-2A work visas, members of migrant families in small and large

camp, and members of seasonal families. Semi-structured interviews were conducted in Spanish and English using an interview guide reviewed by members of the research team and community partners.

The interviews asked numerous questions about their housing, including but not limited to the availability of facilities and appliances, environmental exposure, knowledge, experiences and skills to make housing repairs to decrease risk to environmental exposures, and any health effects they may have experienced due to their housing. Interviewers also took two types of photos for each housing situation: (1) photos of specific items or problems that were particular to each participant's home; and (2) photos of the bedroom(s), living room, kitchen, bathroom(s), and the laundry room.

Due to the close proximity of the housing to the field, concern about pesticide exposure was one of several themes that emerged in the interviews. Many of those interviewed expressed concern about the danger of contamination through take-home exposure, including residue on clothing and shoes. Several mentioned that washers and dryers were not provided and some said that the water was so dirty they had to find a local laundromat to wash their clothes. Several described how they were able to separate their work clothes from their

other clothes and their families' clothes using separate laundry bins. But due to limited housing space, adequate separation of work clothes was a persistent concern and often led to workers sleeping in the same room as their contaminated clothes. This is also evident in the photos of the migrant workers bedroom(s). One participant suggested it would be beneficial to have a chest of drawers for storage space of dirty clothes.

The authors describe several limitations to the study. The results are not generalizable beyond the region of the study due to the qualitative nature of the study and the sample only being from one state. Further, the interpretation of the results is limited to one point in time. However, the study provides important contributions to the literature on farmworker health by incorporating migrant farmworkers', including wives and female farmworkers, perceptions of their housing. The authors suggest that the communication of pesticide exposure risks and the implementation of standardized actions of response are still areas of research in need of attention. The authors also suggest that additional studies are necessary to understand regional differences since the responses may vary in oversight and provisions of employer-based housing. Additionally, in order to ensure improved and standardized housing conditions, there needs to be stronger enforcement of MSPA to protect the health of migrant farmworkers. Lastly, since discrimination against migrant farmworkers has been ongoing in the past half century, the study suggests advocacy for migrant farmworkers to access adequate and safe employer-provided housing.

How You Can Help

Farmworker Justice relies on the support of people like you. Now more than ever, we can help farmworkers create better lives for themselves and their families. There are a variety of ways you can get involved:

Make a donation at
www.farmworkerjustice.org

Support the Shelley Davis Memorial Fund

Contribute through the Combined Federal Campaign. Farmworker Justice's registered number is #10778.

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Thank you for your support!