



# PESTICIDES: SAFETY, EFFICACY AND ACCESS

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QUESTION AND ANSWER TRANSCRIPT

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## PRESENTERS

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## MODERATOR

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*Brian Conklin:*

Hi, Paul. Thank you very much. That has been fantastic. I feel like I learn so much every time I hear you speak. And I just want to recap a few things with Paul's presentation before we go on to the next slide, and that is the serious risk that pesticides pose to everyone, not just to farmers. But farmers in particular spend so much time in their field and have a higher level of exposure to these pesticides. Having lived there, I can think of all the images that I have of children that are leaving their homes and running through fields to go to school back and forth every day and the tremendous amount of these pesticides and dangers that they pose to children.

It's always interesting to know that sometimes to use the pesticides can even make things worse. So, it was great to hear your presentation, and we're not quite done with you yet. And I encourage everyone to continue to stay around because we'll be asking a number of questions, including we'll be going back to our poll questions.

But before I do that I do want to highlight that for those of you who are working with USAID Emissions we have developed a mechanism to access some of Paul's expertise. It's a buy-in through a PASA, which isn't going to mean much to many of you out there but it's a mechanism that we have available. If you have any questions about it, you can please contact us at the e-mail address that's on the screen there: [fallarmyworm@usaid.gov](mailto:fallarmyworm@usaid.gov). But it gives us the potential to come out and do some of the things that Paul talked about with regard to training of trainers and pesticide safety and pesticides management. So, contact us if you have any more questions on that, predominantly for USAID Emissions. I know this probably – the word "buy-in" probably doesn't mean much to the rest of you.

But before we go any further with the other questions, what I'd like to do, Paul, if you don't mind, if we could pull back the poll questions that we had earlier? Because I think – I found it fascinating: The responses on many of the poll questions were actually split. And so, Paul, I'd like to ask you the poll questions and have you answer them. And the first one is: I can trust the labels on pesticides. True or false?

*Paul Jepson:*

I have to tell you I don't see many really great labels in Africa. Often, their hazard information in the form of pictograms does tell you if a pesticide is highly toxic or not, so that is a help. But only certain labels I have seen provide you with the information you require to calibrate your sprayer and apply the correct

amount, and certainly, the levels of toxicity to organisms like pollinators or domestic animals, and also the risk of chronic impact is not commonly on there.

So, although trustworthiness is a thing to really question – isn't it? – it's – I think the major issue is that information is commonly limited on labels and that this information we're providing should be used as a supplement to the label in order to make better decisions. So, I think –

*Brian Conklin:* Go ahead, Paul.

*Paul Jepson:* I think that split is not unreasonable. Let's move on to the next one so we can get on to some fancier questions.

*Brian Conklin:* Sure. Do pesticides have a role in fall armyworm management?

*Paul Jepson:* I can't see the results there. Can you tell me what they are?

*Brian Conklin:* I can't see the results either. But you can go ahead and just answer the question.

*Paul Jepson:* Pesticides do have a role in fall armyworm management. Not in every field and every year, and certainly in this transitional period when the crop varieties that are there lack resistance. But in some cases where you're inundated early in the season with large numbers of fall armyworm you can protect your crop with a spray in advance of the field being colonized widely by natural enemies, and particularly if you use a spray that's not toxic to natural enemies you can get really a good outcome. So, yes, they are usable.

*Brian Conklin:* And then, I'm going to skip the next question because I think your whole presentation has covered that. But the question after that is: Is the label a sufficient guide for selecting pesticides and understanding risk?

*Paul Jepson:*

As labels stand at the moment, I'm afraid not. And I have to tell you in the United States – I run a very large program in the Western United States and we provide information that even supplements the extensive labels that we have here in order to guide farmers on better selection and use. Our pesticide regulatory mechanism in the United States has a fourth part of the process of guiding farmers to what's called safe and effective use, so – although I don't like the word "safety" very much – and that fourth part is direction education of farmers in their fields and in winter meetings. The label in and of itself is a guide but we need further information all to use pesticides in an IPM context everywhere, not just in Africa.

*Julie MacCartee:*

Great. Thank you so much, Paul. It was interesting to see everyone's responses to those questions, and I'm sure that your thoughts about them have changed a bit over the course of this presentation. We have been collecting your questions throughout Paul's presentation, and so we are going to go through and ask as many of them as we can.

So, let's see. I'm going to jump back to a question that came in fairly early in your presentation, Paul, from Paul Ellers, who asks, "When you discussed your farmer training related to risk, did you do an evaluation of training impact two years later? Because time will show if the behavior change really stuck."

*Paul Jepson:*

Thank you very much, Paul. No, we didn't get the opportunity to do that because funding for such things is rarely available, although we're really love to. Reinforcement is essential, though. We have no expectation that this information will be sustained in the system for a long time, partly because of the counter-information that is provided by those forces in our society that are less interested in the good outcomes that we are all seeking. In Africa, if you look at farmer field school outcomes, there is a decay period with a half-life of about one and a half to two years. So, four years after training farmers commonly – unless there's been a reinforcement or they've been sustaining themselves through some continuing social process – do lack some of the skills that were developed when they were doing the farmer field schools.

So, if we're going to do this, we need posters, we need campaigns, we need YouTube videos, we need that information to get out there widely and to be reinforced and constantly supported. And this is what we find in our system in the States where we have very similar issues and we need to constantly repeat and reinforce and support this information, because there's other information out there – some of it well-meaning – but still, if it's not scientifically based and

doesn't address the uncertainties that need to be understood, it's unhelpful. And so, you get a dilution of the impacts of the contribution that you've made. So, it's very important that we sustain this and build it over time. Thank you for your question.

*Julie MacCartee:* Great. Thank you, Paul. Another interesting question from Paul Ellers came in. He said, "We really should start from the premises that smallholder farmers have no access to or are not willing to use protective clothing. It may be too hot or humid or they just don't have access. How does this affect your recommendation?"

*Paul Jepson:* It has a profound effect on our recommendation because Paul's describing the real world. Pesticide labels tend to assume what's called good agricultural practice in Africa just as much as they do here. They're often based on assumptions of western levels of exposure, not African levels of exposure. And the assumptions about body weight of those that are exposed and the health profiles and co-factors of those that are exposed do not reflect anywhere in Africa other than possibly South Africa, which may well have more sophisticated mechanisms, do not reflect true exposures and true vulnerabilities.

There is no label in the world, as far as I'm aware, talking to the global experts on PPE, personal protective equipment, a couple of weeks ago that reflects actually the exposures that occur when backpack sprayers are in use. And this is something we want to work on and develop a research stream about, and there are other people making efforts here.

And just as a final thing, that there is a group in the world that's trying to contribute information in a positive way to inform farmers. And in India, for example, the country of India, they're screening 160 commonly available clothing fabrics to find out those that are most restrictive for pesticide access. But as a general rule, my argument is – and I've not found a farmer yet who's ever disagreed with this – that if a pesticide to be used safety requires you to have personal protective equipment that's not available to you, you should not use it. And that's easier for me to say than actually achieve. But there are some pesticides out there that have limited toxicity or no toxicity, BT being one of them. Overusing that would be bad, but why is this not registered in a widespread way in Africa at the moment? And why is it not being used more than it otherwise would be?

And there are other botanically derived pesticides that have been through proper regulatory mechanisms that also seem to show promise, like azadirachtin or neem, and also a chemical called spinosad, which is based on fungal organisms. So, there are a series of pesticides, including some synthetics, that have less of a requirement of PPE. But it is a concern of all of us that we're – the bar – if EPA's methodologies were to be used in Africa, many, many pesticides would no longer be sold in the African marketplace. It's a fallacy and it is false to claim that if a chemical is registered in the States, it is therefore appropriate in and of itself a priori to use in Africa. If we used our methods in many African countries, many compounds would not be registered there. And I cannot repeat that or emphasize it more.

So, anyway, thank you, Paul, for your question. If there are any other Pauls out there – this seems to be the Paul Agrilinks.

*[Laughter]*

*Julie MacCartee:* Well, at the moment I'm going to switch to a John. So, thank you, Paul, for that. But John Bowman asked related to PPE: "Of the six to ten efficacious or low-risk pesticides that you mentioned, are there any that have a reentry period of about one day without personal protective equipment?"

*Paul Jepson:* All of them would have that. Anything that comes out of our shop here in terms of the final list that seems to be appropriate, I will personally make sure that we're not requiring an unreasonable restricted entry. It doesn't mean you should not be cautious. Absolutely not. And here's one other reason why you shouldn't – you need to be cautious, even with a chemical that has a low restricted entry interval. If you have not had training on how to open a bottle, how to avoid accidentally putting your thumb on that gooey deposit that's in the lid of the bottle, if you've not had training on how to pressurize the sprayer and avoid contaminating yourself, if you do not understand the small amounts of pesticide that can achieve efficacy, and that you need to walk at a constant rate and put a low concentration field of pesticide over the whole crop rather than standing by an infested plant and painting it with the lance, if those things are not part of your knowledge base and the concepts are not clear to you, then you can be exposed hundreds of times more than is implied by the label or even the restricted entry interval that I have just provided you with.

So, please don't forget that if a pesticide is applied at a higher rate than was intended, the restricted entry interval would go up. And one thing we're going to try and do is provide guidance on that, because with some pesticides you can gradually increase exposure and not necessarily experience a severe health outcome. But there's a threshold level where severe health outcomes can occur in some cases. And so, we need to be very, very cautious about this and constantly question the role of pesticides in IPM against fall armyworm fundamentally.

However, if the informal marketplace and the way pesticides get distributed in villages and someone sees a farmer who has applied something toxic, he was nauseous after spraying and his kid got sick and his goat died, however, the field was protected, that's an incredibly powerful driver for other people to do the same. And so, in recognizing that, what we want to do is reinforce all of the messages in what we're providing for you, including getting the concentration in the tank right and not over-applying the chemical. So, anyway, I know this is complicated for everybody but I hope it makes sense. And all of this really – we have certainly about this. This isn't a kind of advocacy argument.

Yeah? Go ahead.

*Brian Conklin:* So, Paul, just – we've got about ten minutes left. And so, in the nature of trying to get through a number of these great questions we're going to pull you in to be a little more concise, I think, on some of these. Julie's got a couple more questions for you here.

*Julie MacCartee:* Sure. Thanks, Paul. Let's see. Two related questions. **Dumasani Kujiwaio** asks: "Do we have any efficacious botanicals against fall armyworm?" And then, **Jay Camacho** asks: "Has there been any research done on organic methods for pesticides or pest controls against fall armyworm?"

*Paul Jepson:* So, some of the pesticides I've mentioned to you already do have organic formulations. But some of them also, like spinosad and possibly BT, have formulations that aren't strictly speaking organic. But yes, that is – that's an interesting point. And I think what we might do is make a note on the information we send to you about labels that are organic. Organic provides no guarantee at all about protection for human health, by the way. You still have to



look at the label, and very toxic materials are used in organic systems. So, again, a common fallacy there, but none of us are here to reinforce that fallacy, I'm sure.

What was the other question? The first part?

*Julie MacCartee:* It was about botanicals. If those are available.

*Paul Jepson:* Yeah, but remind me. What about them?

*Brian Conklin:* Are there –

*Julie MacCartee:* Yeah, just any efficacious –

*Paul Jepson:* Okay, okay. Okay. Well, neem or azadirachtin is botanical, and that's been through a full regulatory process and it's in a formulation that has a shelf life that you can rely upon and it's a dose rate that we know. Reputationally, there are some botanicals out there that we've heard about that may have some good efficacy. There's one that's used in Senegal that's a blistering agent and causes severe dermal rashes and blistering if you're exposed to them. And there's another one I heard about which I'm not going to name here, which is a profound systemic poison in humans. And so, we do have to be cautious if materials have not been through a proper regulatory process about what we say about them.

However, I think a group of us have a strong belief that there's certain botanicals, some of which might be locally formulated, that have a lot of potential. We just don't know enough at the moment in order to build a knowledge base for which ones show greatest promise. So, thank you for the question. I'm trying to be shorter, but that's my answer.

*Julie MacCartee:* Thank you, Paul. Another question came in from [Marjata Ileta](#). If we have short-term programs in training, coaching, and support, such as the farmer-to-farmer program, where would you recommend such assignments focus? Given the serious health concerns, should they focus on pesticide training, despite the fact

that in IPM pesticides are the last resort? Or should they focus on practices of first resort, such as management, et cetera?

*Paul Jepson:*

Well, my answer to that is both, I'm afraid. And you can have the conversation about pesticides in, for example, a conversation about natural enemies and biological control. So, synthetic pyrethroids, for example, are profoundly toxic to spiders and some parasitic wasps and other natural enemies, and they stop natural enemies feeding for a period. That's other research that I did.

And so, it's very important to talk about the two at the same time. And if you develop a method of discussion where you're not treating them as separate silos of information but you're thinking about crop management as a whole as your guide – how are you managing the crop, how are you making decisions, when might you have to make a decision about the pesticide, how do you know if the natural enemies are abundant enough to be cautious and hold back from the pesticide – I think you'll find you can just free up your thinking and have conversations that include both. That's my suggestion.

*Regina Eddy:*

This is Regina Eddy. This is Regina Eddy, the fall armyworm coordinator here in Washington supporting the webinar. I want to build on Paul's excellent comments. And by the way, Paul, extremely useful presentation. There's a lot of very good information there that we hope people can download and use some of the links and graphs. But building on Marjata's insightful question, Paul during his presentation framed a challenge as very critical, I think, for all of us, which is how can science be translated into actionable information that does lead to behavior change? And that's really what the spirit of that question is about, and I just wanted to underscore that through our partnership at USAID with Oregon State University and specifically Paul Jepson we will be providing support exactly in that space.

So, Paul is developing, as he noted, three training guides that will help at the village and community level animate important conversations to support farmers in the decisions they need to make in their farms. And what he is proposing is this broad integrated pest management framework, which we understand requires some experience applying these questions. And so, through the pictograms, through the activities that he has developed with others that will be captured in these training guides we hope to provide support and information on exactly how to focus that conversation. And we also will be able to allow experts from Oregon State University and others who Paul Jepson aggregates to visit a

country, provided you've got some funds, to actually lead some of those trainings when you find that imperative.

So, I just want to really underscore that's a very critical question. We are trying to work in partnership with our field actors and with the excellent science and research experts in the US and globally to really support that exact process.

*Julie MacCartee:*

Thank you, Regina. And for all of you on the webinar we have pulled up some of our ending polls. We still have a few more minutes for questions, but in the meantime we would love to know a little bit more about whether you can apply this to your work and some of what you've learned and would like addressed in future webinars. This will help us plan for our future webinar series.

All right, Paul, a question came in fairly early on from [Asa Baliera](#), who is from Senegal, and said that "One of the problems is in general our farmers cannot read, so they do not know the level of toxicity in their product. What would you recommend for farmers who can't read?"

*Paul Jepson:*

There are some color codes and indicators on pesticide labels in Senegal that don't require reading literacy. Although, the labels are in French; they're not in all of the local languages. The pictograms were developed with farmers so they could go and talk to their neighbors and discuss different pesticides using the pictograms. And we explained what lay behind each one, by the way, so they understood what they indicated. And we found farmers, whether or not they had the ability to read, were incredibly articulate in explaining these and weighing up the pros and cons of different approaches. And so, we found that pictorial method to be quite effective.

And part of the international code of conduct for pesticide management is that there would be some level of kind of pictogram or color coding or other indicators on label that don't require you to know the language of the – on the label or even be able to read it in order to get some basic indication of toxicity. But you are describing a problem, and fundamentally I often ask myself why certain pesticides are even available in some places when you require so much knowledge that – some of it written on the label – in order to use them in an efficacious way without undue risks.

And so, that's a dilemma I've struggled with for a very long time. But the pictograms that we're going to provide you with can be used as a supplement to the label and don't require reading. So, that's the best I can suggest, I'm afraid, and we hope for better over time.

*Julie MacCartee:* Great. Thank you, Paul. All right. We're going to squeeze in one last question before we wrap up, and this is from **Yenna Balinai**, who said, "Can you share a few words on your experience in access to low-risk and affordable pesticides in Senegal or perhaps other countries in Africa? What are you finding is available to people at the village level?"

*Paul Jepson:* Thanks, Yenna. We certainly found in every kiosk that we went to – and I've been to about 40 kiosks in that work – that there was – or, we – there have been 40 kiosks visited; I didn't go to all of them. But there are always available compounds that are less toxic and compounds that are more toxic. It's somewhat distressing to see low toxicity materials in limited availability. There's one particular reason for this. It's that some of the lower toxic materials you really have to apply them very well for them to achieve the effects on the pests that you can achieve easily with some of the materials that are highly toxic. Even if you apply some of the highly toxic materials very badly, they are so toxic and so persistent that you're going to get some level of efficacy.

So, the reputation of some of the less toxic compounds is not as good as it should be in a system where good application processes are followed. And this is a tragedy, really. And in some cases the pesticide industry itself bemoans the fact that there's reinforcements of the use of some of the more toxic materials because of this phenomenon. It tells you a lot about the suitability of pesticides for use anywhere, but particularly in some parts of Africa where access to extension education may be limited. But I – always, we've found some materials – and you can always in Senegal, for example, find Biobits and one of the BTs and some of the less toxic pesticides. Synthetic pyrethroids, some of them have low concentration formulations and can be efficacious against some pests – not fall armyworm. So, it is possible.

What really is needed is a local guide in each place, and then farmers saying, "Well, we want some of the less toxic stuff." And then, the merchants acquire those pesticides and you kind of reinforce the local markets. And it needs a process like that to really make it work in the long term.

*Brian Conklin:*

Okay, Paul. I want to thank you very much for taking the time today to be with us. For many of you, you probably don't know Paul was – had to start speaking at close to 6:00 AM his time. And we're grateful that someone with his level of expertise and experience would be available on a webinar like this. I hope it's been informative for all of us to walk away with a much better understanding of the dangers and the toxicities of pesticides. In so many countries it seemed like pesticides were the easy, political, expedient to demonstrate to farmers that governments could do things, but we're finding out now that really – that that was probably not the best choice in many cases.

Throughout this series we have talked about the importance of an integrated pest management approach. And we in our first webinar went through a whole list of tools that are available out there, technologies that are effective in addressing and dealing with fall armyworm. We've highlighted a number of tools and we're working with colleagues around the world to provide you with the best tools available to address the fall armyworm.

We want to thank you for spending these last three weeks with us. If you've missed any of our podcasts, we – any of our webinars, we encourage you to go back and download the webinar. It's available for your use. The PowerPoint presentations are available. There's a lot of great information in there. There are resources and there are links. We are available here to help you in any way that we can, and we'll continue to work to put out these tools that are helpful to help you practically address finding ways to manage the fall armyworm.

And with that I want to thank everybody for taking the time and wish you well.

*Julie MacCartee:*

Thank you all. We'll go ahead and wrap up. Thanks to Paul, our USAID team here, the Agrilinks team for hosting the webinar, and most importantly, to you, our attendees. We'll see you at a future webinar.

*Brian Conklin:*

Thank you.

*[End of Audio]*

