

TARGET: Zero Hunger

Episode 9

A race to save the banana

[Sandra] Hello and welcome to Target: Zero Hunger – a podcast that explores the food challenges and solutions of our time, brought to you by the UN’s Food and Agriculture Organization. I’m your host, Sandra Ferrari.

[footsteps in Jakaranda Banana plantation]

[camera sound]

[Fazil] Do we have spray?

[Altus] Yes.

[Fazil] Thank you very much. [Sound of spray bottle]

[Various background sounds – people discussing plants]

[Fazil] No, no no... from a distance... that’s enough [Camera click. Fazil taking photo. People talking in the background]

[Unknown speaker in background] Is it confirmed? Yes? Panama!

[Fazil] Ah, another victim!

[Fade down field tape]

[Sandra] The main voice you’re hearing here is FAO plant disease specialist Fazil Dusunceli -- inspecting a banana plantation in Mozambique. Two year ago, this farm was diagnosed with a deadly banana fungus, called Fusarium Wilt Tropical Race 4 – also known as Panama Disease. It’s the most destructive disease that can affect bananas -- and if it’s not managed properly, it can spread easily and bring an entire country’s banana industry to its knees.

[Fade back into field tape]

[Fazil] So this poor bunch will not develop in to a banana. It will not find its way...

[foot steps in field]

[Fade out field tape]

[Intro music IN]

In this week's episode, we're doing something a little different. We sent one of our FAO officers into the field and asked him to document his week-long mission to help stem the spread of this crippling fungus troubling the world's most-traded fruit. We follow him to Mozambique and South Africa where he meets with banana farmers, disease experts and concerned government workers, who all share one interest: containing the disease. But what does that mean? And what's at stake for the 36-billion-dollar industry? Not just for the banana companies, but for the local communities who find work on the plantations. And also, for producers elsewhere on the continent?

[Intro music OUT]

[Sandra] Now that Fazil is back from his trip, we asked him to join us in the studio here in Rome to reflect on his journey. Fazil hello, thanks for walking us through this story.

[Fazil] Sandra, hello. My pleasure to join you.

[Sandra] So, before we go into the field tape, can you explain in a nutshell what Fusarium Wilt is and why producers are so worried about it? How does it spread and how many countries are affected right now?

[Fazil] This is the most important disease of banana, I can say. It is soil borne fungus and can spread by a number of means.

[Sandra] Such as?

[Fazil] Such as infected planting materials, for example, in the first place. If the planting materials, seedlings, you want to use to establish your plantation, if it already has even one spore within it, if it is infected, then you introduce the disease into your field yourself. Or it might come from outside with infested or contaminated soil particles that may be attached to your boots, the tires, the vehicles...with water, irrigation water, drainage water... And the reason for the producers' worry is, once it's there in the field, in the soil there is no practical means to eradicate the disease from that plot. There is no effective chemical that can kill the fungus completely and the second aspect is, currently there is no alternative to the currently available banana varieties, which are susceptible. Around 50 percent of the banana production comes from a variety known as Cavendish – that we find today in the market. Those yellow beautiful fruits. In fact, they supply almost half of the banana output and this variety is the most susceptible to this particular race – the tropical race 4. I can say around 15 countries are affected by this mostly from Southeast Asia. The current concern is, within the last few years, the fungus jumped from southeast Asia to Africa and Near East. And in Africa it is reported from one country only, right now. But in the Middle East a few more countries have been affected. And this shows the disease can jump.

[Sandra] So Mozambique... why did you go there and what did you do there?

[Fazil Studio] Nampula area is situated in the North and there are two commercial banana plantations, which are affected by the disease. When the disease was detected in Mozambique the government informed us and they requested support of FAO to tackle this problem there. So we quickly investigated the situation, made an assessment and we formulated an emergency project. We have invested in capacity building. Now they have a laboratory, they have people trained for detecting, for surveying the disease. So my mission was... for the concluding workshop of this project.

[Shifting chairs in the concluding workshop: audio – chatter room - sound]

[Altus] If we just look at the geography on the Nampula province. It's a relatively a dry area....

[Sandra] So who's that talking in the tape?

[Fazil] That's Altus Viljoen from Stellenbosch University of South Africa. And he's talking at the workshop in Mozambique, in Nampula. He's one of the leading banana experts globally. At Stellenbosch they have a leading research lab in Africa on Fusarium Wilt Disease. And Altus in fact was the professor who first confirmed that TR4 was detected in Nampula, Mozambique.

[Altus] The direct impact is it's causing a tremendous amounts of damage. There has been at least 700 000 plants have been killed at Matanushka now and 1,200 in Jakaranda at this stage. Which obviously, in terms of production losses, is tremendous. If you get losses of about 15 000 plants a week, more or less the cost it could work out to is \$250 000 dollars a week. For everyone it means money that you lose...

[Fazil] So he's explaining the impacts of the situation to the country and the farms. And this is really a complex issue. You want to prevent the disease from spreading to other countries, but you cannot just abandon the farm and go. There are workers to consider -- there are 3000 people, workers, earning a living from those farms. And the farms themselves, of course. And the local community, as well as the social and economical aspects for the region.

[Altus] As I said it's about a half million people depending on bananas. So certainly if banana are lost in the area, worst case scenario, it would affect a lot of people. Already it affects people who work on these farms. People who get income from there, but sometimes also food. And then obviously if you look at the rest of Africa. If you look at the bigger picture, it's a major food crop. In terms of indirect impact, is also the contribution to the local economy. There's a lot of economies in the area depending on these companies. And then also some other services – health services, education....

[Fazil] After the workshop a few international experts went on a field trip one of the affected farms – Jarkaranda. Three hours away from Nampula.

[Car engine sound – music on Farm]

[Fazil] This is us arriving at the farm.

[Fazil putting on protective gear, funky music playing in courtyard]

[Sandra] What's that sound?

[Fazil studio] They were boot covers. These foldable boot covers. You can just put it over your boots or your shoes. I had these as an additional measure, my invention!

[Sandra] You just wanted to be extra safe.

[Fazil] Extra safety.

[Music fade]

[Fazil] So after arrival we first sat down for a coffee with the management and workers and a few technicians of the farm and they were explaining how they started the business there, the plantation, and how they discovered the disease.

[Fade in coffee chat tape]

[Farmer] To get back to your question, we are part of a larger group called **Fairbank, Cooper & Lyle** actually and we do farming around the world -- mostly in Latin America. And in 2010, we were basically asked to look at Mozambique. Some of our friends said it would be good to come to Mozambique and some of the authorities there were saying, if we couldn't come and do something for them. So we went here. The guy... is Abilio around? He and one of our guys from Germany bought two motor bikes and I think they spent three months up in this area just biking all the roads and finding where it was possible and talking to local authorities for those two months...

[Fade out coffee chat tape, keep running vaguely under Fazil narration]

[Fazil] So the group that runs the farm only got there 5 years ago. The companies they were already supplying bananas to in Latin America suggested that Mozambique might be another good place to for growing bananas and so they got the license from the government and set up the shop there. And then they discovered the disease about two years ago when they were still in the start-up phase. There were some heavy rains and that helped the spread of the disease in the farm pretty quickly.

[Farmer] We did one mistake – we didn't drain, because nobody here drains. Matanushka didn't drain and nobody around who grows anything, drains. In Latin America you wouldn't think about doing a plantation without doing drainage – but we didn't, because nobody is doing it here, because they said it is not raining here, so you don't have to do that. And that took us by surprise, when was that – two years ago? Because then it rained. And so much that everything was basically under water.

[Fazil] right...

[Farmer] But that's the climatic changes that are taking place.

[Fazil] How about the disease? How did you discover, what happened....

[farmer] You have to talk to that one... [laughing]

[Fazil] Did you discover it?

[Gladys] Yeah, well.... Oskar!

[Farmer] Who was it then?

[Gladys] Oskar... so then he called me and he said, I found a plant that is yellow now – a yellow leaf and so we went there. We discovered and two weeks later the samples went to Stellenbosch.

[Sandra] So what do they do then?

[Fazil] Well, there are a number of things to follow once the disease is identified in a plantation. One has to intensify surveillance within the farm. They have to look for diseased plants regularly/ They have to get to those infected plants immediately. So those spots need to be fenced out and nobody should enter those infested areas without permission.

[Farmer] In the rainy season, we get behind in burning. Now we have 200 cases and it's been pouring down for 5 days... the guys give up. You can't get the damn thing to burn. So what they do in the Philippines is they chop it up put it in a plastic bag, put that plastic bag into a carrier bag – so it's doubled – and so they put it in a pick-up truck and they bring it out to a special dump site where they burn when they can burn. They do that through the rainy season – and we will now adapt that.

[Fazil] And there is the question of continuing with the same bananas or switching to another type, perhaps a new variety or another crop altogether. All of those are the questions the farmers and scientists are trying to find answers about.

[Farmer] We have 100,000 plants here. I think we are looking at a life span for this plantation of two to three years more and then – as a Williams (banana), as a Williams plantation.

[Fazil] Then you will replace...

[Farmer] We will start to replace by the beginning of next year. It's gonna tip over after two or three years from now to be more soma-clones than Williams...

[Sandra] What are these clones they are talking about?

[Fazil] Well, these are the soma-clones and they are the types of Bananas similar to Cavendish, but might have some level of resistance to the disease. These are the selections from among the thousands of plants originating from Cavendish variety through tissue culture and they resemble the Cavendish banana in shape and taste. But one has to be cautious as well, because this entails a number of other challenges. As I said, uncertainties regarding agronomic adaptability and suitability for processing and transportation. Plus, of course, the productivity. How much will they produce? Will that be enough? There is a research institute in Taiwan, Province of China, that has been working on development of bananas using this methodology. In fact, this work has provided some hope for banana production there and also in Philippines where thousands of hectares are abandoned due to this disease. These clones have some disadvantages, compared to Cavendish bananas, such as they.. they show, yes, some level of resistance to tropical race 4 but unfortunately they might have some agronomic disadvantages like taste or maturity period... might take longer for them to mature. So certain adjustments are needed in the field and in processing and transportation. But nevertheless this option can be considered in cases like this where the disease has spread quite a lot in a plantation and and there is no other option to use.

[Sandra] Question. Have you ever tasted the other variety, that new... **[Fazil: yea!]** Oh... what is it like...

[Fazil] I've actually tasted it in the Philippines. It's almost the same! A little sweeter... the issue is some people don't like sweet bananas. And it is hard to change people's shopping behaviors and preferences.

[Fade back into coffee chat]

[Farmer] Shall we go and have a look? Yea, let's go. And later we will come back and get something to eat. That's at least the plan.

[Sounds of car going through deep terrain/brushes hit against the car]

[Fazil Studio] Right, ok, this is us driving to the actual plantation in jacaranda.

[Car arrives. Sound of hand break] [Car doors closing. People taking photos outside of car]

[Fazil] Fazil. Nice to meet you.

[Chatter]

[Gladys] The plan is to go inside and visit the green zone now, where are the soma-clones.... Here people change clothes and boots and everything...

[Picking out protective gear – various sounds and voices]

[Fazil] Size 44, please.

[Continue field tape as soundbed under Fazil in studio]

[Fazil] So, we went into the actual plantation to see the infected plants and how they are containing the disease in the plantation.

[Field tape IN]

[Farmer] You wanna see more sick plants? You wanna go see a really sick plant?

[Sound of Fazil walking and snapping photos]

[Fazil] And here in the middle there were bananas, and now there is none [walking sounds—in tape]

[Fade down field tape – Continue sounds of Fazil walking as soundbed under Studio narration]

[Fazil Studio] And you could see really where water had been running and where trucks and people move, because that is where all the infected plants were, and you can tell how it travels and spreads within the plantation.

[Fazil] And there, all the dead plants seem to be along the pathway, along the road. It's amazing.

[Walking sounds. Camera clicks.] Here's a banana plant burnt.

[Fade field tape to background]

[Sandra] Let me ask a question here: if the disease affects the Cavendish why do producers not just plant other types of bananas?

[Fazil] Well, some are doing this, in some countries, some farmers are doing this. For example in Indonesia, the producers switched to more local bananas. But these are only for local consumption, and not suitable for exportation. So many producers prefer the Cavendish variety as it brings more income. It's also the preferred banana of consumers, particularly in the West. They just like the look and taste of this banana.

[Field tape fade back in]

[various researchers chatting, sharing impressions 11:00]

[Fazil] So the doctor is here...

[Altus] Fazil... Let me tell you what happened here. So we investigated first on the outside – no symptoms.

[Fazil]: Outside, no symptoms.

[Altus] So we go a little bit deeper...

[Fazil] Right. One layer. Two layers, no symptoms.

[Altus] And then the third one! There you see the disease.

[Fazil] There you go.

[Altus] So if you go to a small growers farm, and you don't want to cut it down, you can just close it and tape it up. Then you bring your investigating team and they will then properly destroy this and contain it.

[Fazil] Could you open up the third layer a bit more?... Wait wait wait... Camera is ready.

[Cutting sound and plant falling down hard]

[Everybody] Oh wow!

[Altus] [chopping sound]. Nothing here. Can you split it a little more [sound of plant being torn] Oh, there you go!

[Woman] It's amazing. It's just a small stream coming from the roots...

[Altus] Yea... it's very early symptoms...

[Fazil] So what Altus is showing here is that you often can't see the fungus – it often travels either in plants or on shoes or on tires, etc, and without people knowing it and noticing it. So, if you are a farmer who suspects that the disease might be there, you need an expert to come in and to take samples and do the analysis to confirm if this is TR4. That's what Altus and his team did at the two farms in Mozambique two years ago and that's what led us all to create a global Fusarium Wilt program and coordinate a response globally.

[Fazil in the field] Don't come to close.

[Colleague] But you're closer than me. [laughing]

[Altus] These are all plant pathologists, you know. They're all getting excited. This is better than going to the bar tonight! [More chopping, sound of burning, fire]

[Field tape OUT]

[Sandra] So why is it called Panama Disease if the disease is not in Latin America?

[Fazil] That's an interesting question. In the 1900s this race 1 spread widely in Latin America and then to other parts of the world. At that time there was this preferred, strong robust banana, what's called Gros Michel.

[Sandra] Big Mike...

[Fazil] Yes, yes... and it was tasty and it was also very suitable for processing and exportation and marketing... it was a preferred banana those days. But this race 1 just affected the Gros Michel and devastated many countries – in fact the export industry came to a collapse almost at that time. Just around those days the Cavendish came to rescue.

[Sandra] And now producers are worried about the Cavendish.

[Fazil] Cavendish is facing the same challenge.

[Sandra] At that time we were lucky to identify Cavendish, but at this time we don't seem to be so lucky to have an alternative variety which can be adapted largely or locally to be resistant at the same time.

[Sandra] So before you both flew to Mozambique, you visited Altus at his University in South Africa, right?

[Fazil Studio] Yes, that's right. I went to see his laboratories first, before going to Mozambique, just to see how they work, what they have and I asked him how he felt when he first discovered that TR4 was present in Mozambique.

[Stellenbosch tape IN]

[Altus] Well obviously a little bit shocked, and I didn't immediately believe it so I asked the students to go back and do a re-identification, and come back and tell me if it's that. We actually expected it to be the same strain that's present in South Africa, but not something to come from Asia at that stage. So, they went back and came back with the same results so I sent them back for a second time and it always turned out to be TR4 so I realized we were dealing with something quite serious in Mozambique then.

[Fazil] Why is it important for Africa. What might be the implications for the banana production in Africa if the disease spreads from Mozambique to other countries?

[Altus] Banana production systems in Africa is mainly based on small growers. So it's small farms from ½ hectare or even smaller up to two hectares, and about 95 percent of all banana farms in Africa consist of these things. So, in terms of containment or eradication of infested areas, infested soils, it's just impossible to do because then you take the income source away from small growers. The fact also that the fungus in soils use, it survives for so long so that means that you cannot continue production. Even if it's another crop you still have the spores that might spread to other areas. So, it's so much more difficult to handle it if you have a system like that. If you have large scale monoculture, Cavendish production, owned by a company of maybe a thousand hectares you can probably cut 40 hectares out where the disease came in initially. And a small grower with a quarter of a hectare, half a hectare, there is just no way you can tell them don't move there. And even if you tell them, because you cannot see the fungus, they might move one week later, they might go into that area again and move the pathogen. The second thing is also the production system – in large scale systems – they use tissue culture to plant, so clean planting material produced in laboratories... Small growers cannot afford that. They have to take suckers from specific areas and move that for their planting materials. So if these things have been in contact with a fungus they just spread it so quickly. So basically Africa is extremely vulnerable to diseases and pests coming in simply because of the nature of the production systems there.

[Stellenbosch tape OUT]

[Sandra] So are Latin American countries worried now that Fusarium Wilt Race 4 will come to Latin America?

[Fazil] Yes indeed, Latin American countries are extremely worried about this race because they suffered most from the race 1 in the last century and their economies and livelihoods of many smallholders and workers depend on banana production especially the Cavendish production. Through this global program we are aiming to bring together the people working in different areas like research – because research is instrumental – and in plant protection institutions - regional and national - and also the industry representatives through the World Banana Forum especially because this is also very key for combating this disease at the global level. And also of course the smallholder producers and NGOs.

[Sandra] So awareness raising seems to be a key part in all of this.

[Fazil] Yes, indeed. Although in some regions local awareness is increasing, in many places a lot of producers and government officials just do not know still about the disease or do not pay

enough attention to the disease. Back in mozambique when we were driving to jacaranda farm together with George Mahuku – who is a senior expert scientist and Joe Agosto of IITA...

[Sandra] The international institute of tropical agriculture working in africa particularly, right?

[Fazil] That's right, and we discussed a lot about this aspect.

[Sandra] You did a lot of driving...

[Fazil] Yes, indeed we did.

[In-Car audio, 4-wheel drive sound]

[George] Yea, I think the problem is very real. And I think from what we saw last year and what we saw this year the problem has increased and something needs to be done very soon to make sure it doesn't get out of the places where we are right now. So I think continuing is one of the things we need to focus on and we need to educate people so that they know what is at stake and they are not caught unprepared. These days media is really powerful. And also some of these new technologies like whatsapp. Those can be used to reach as many people as possible, but I think packaging the information is really good. You need to package it in such a way that it reaches the right people with the right information, otherwise, if you're going to talk to a farmer from a scientific perspective he may not understand what is happening.

[4-wheel drive sound OUT]

[Sandra] So what about the farms that are heavily affected. What alternatives do they have?

[Fazil] Well, there are some efforts to test adaptability of a few of the crops in Nampula. The other farm, the other affected farm in the province, for example, is doing experiments with pineapple and a few other crops. But there's always the profitability aspects for investors and such transitions are not easy as one of their officers explained during the workshop.

[Fade in Matinushka finance officer] There is a concern – and that's the reason we have to do the trial first is that the cold temperatures this time of year - May, June, July - are too cold for this variety of pineapple. So this is the variety that the market wants, but we don't know if we're too subtropical, too far away from the equator to produce a good version of that fruit. Our banana can last four weeks in a container and so we can go to the Middle East through the current routes and that's a very difficult time to transport pretty much any other tropical fruit. So pineapples, mangos don't last that long in a container. And so there will have to be some sort of other leap of faith or development of the shipping lines that have routes much shorter to the Middle East. The discussion around alternative crops is very important but it's extremely everybody understands it can't happen from one day to the next. Or even one year to the next. One that note, I just would really like to extend our gratitude. We know we're not alone and

we're working with a group of professionals that will see us through to the end. Thank you very much.

[Fazil] You can tell that this situation can be really overwhelming. One has to be there in the affected farms to feel that. And there is a lot at stake and there's a lot of pressure to respond quickly and in the right way. That's why it's so important that producers and researchers and the governments on all the continents work together because everybody is very aware that the impacts of this disease can be wide reaching.

[Theme music in]

[Sandra] When it comes to diseases – the world has no borders. And the more we develop preferences for exotic foods from distant locations as our go to snacks, the more vulnerable our production chains are to threats like Fusarium Wilt.

That's why international cooperation is more important than ever, to detect and contain these diseases – but also to make sure today's favourite banana is still on our grocery shelves tomorrow.

This episode has been produced by myself and Kim-Jenna Jurriaans.

If you have any questions or feedback for us please write to FAO-audio@fao.org. I am Sandra Ferrari. Thanks for listening.

[Theme music OUT]

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