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Lukxmi Balathanan [00:00:06] Welcome to this bonus episode of The Food Fight podcast from EIT Food.

Matt Eastland [00:00:10] In these episodes, we want to shine a light on new projects and agrifood start ups and hear about their efforts to fight for a better future. This week, we're handing over to Graham Bonwick, to tell us about AgriFoodX, a start-up extracting value from waste by developing sustainable and biodegradable plastic alternatives.

Graham Bonwick [00:00:39] Hi, my name is Graham Bonwick, Co-founder of AgriFoodX Limited and we're fighting for the future food because we're passionate about fording a circular bio-economy.

[00:00:53] At AgriFoodX and we try to extract value from waste. Perhaps agrifood by-products is a better term because it's more of a resource than a waste. So we are obtaining materials from agrifood by-products that we can use to develop biodegradable, sustainable, flexible films. So replacements for current oil-based plastics and these have applications in many areas, for example as packaging, but our actual focus at the moment is on their application in the agricultural sector. So we want to use these materials to replace the current oil-based plastics that are used for things like films, weed suppression membranes and also silage wrap. We want to replace these materials with something that's now biodegradable and compostable. The current materials are not. And the current materials, these oil-based plastics tend to end up in the environment, they damage the soil, they contaminate water courses, and they also often get burnt as well at the end of their life rather than being collected and recycled. And that also contributes to pollution of the atmosphere.

[00:02:11] From apple pomace, we can produce a film we can produce in varying thicknesses and the material is fairly flexible as well. This means that it can be used in a variety of situations. But our key focus is use in the agricultural sector. The material is slightly transparent, but we can actually add other materials to it to really cut down the light transmission. And this is important for example, if we want to control, for example, weed growth. The material is very similar to current plastics, but we have to blend it with other materials, other by-product materials, to get a wider range of properties. So if we want to improve its resistance to, say, moisture or resistance to oxygen, it depends what we're trying to achieve. We can blend it with other waste materials if we want to improve its strength. Again, it's a case of finding the right combination of materials to give us that combination of flexibility and strength. And what we're trying to achieve is a product that resembles current material. So, for example, polyethylene. The reason for doing that is that our material has to be compatible with current agricultural machinery and practises. We can't have a situation where new machinery would need to be purchased by farmers. So what we're trying to do is develop something that's fully compatible with current practises.

[00:03:46] Globally, about four hundred million tonnes of plastic are produced and despite our best efforts at recycling, a large proportion of that still ends up in the environment. In the agricultural sector, again, a very large percentage of the material is not recycled. In fact, for the UK, around about forty percent of plastic sheeting is still lost to the environment. So a large proportion of the plastic films that are used agriculturally never get recycled. And the problem with that is that those materials start to break down, albeit slowly. But they introduce plastic microparticles into the soil. They also, those particles can

get into nearby watercourses. So we have a problem of soil and water contamination linked to the use of plastic films. As I said, one of the solutions is often to burn these materials, which is illegal in the UK. And by burning these materials at low temperatures, that also releases a variety of toxic materials and gases, including CO₂, back into the atmosphere.

[00:04:58] The benefits of our products are that in the environment that it will break down, it may even contribute to soil health. If we have a blend of materials, includes fibre, for example, that may actually help contribute to soil structure, but certainly will not release microparticles into the environment. The material is fully biodegradable and also compostable. Theoretically, it could be left in place at the end of its use. So rather than having to collect it, clean it and send it to recycling, it can be simply ploughed back into the soil or even left in place, depending on how the farmer wants to use it. The other advantage of using this material is that, again, it actually avoids the use of pesticides by using these membranes. There is a positive benefit, potentially reducing pesticide use if they are used in greater quantities. Overall, it's carbon neutral. So we're using waste materials, waste from food and agricultural production. We're turning it into a membrane or film which, when it breaks down, will release CO₂, but overall its net-zero carbon emissions. So we're contributing to sustainability as well as protecting soil health and protecting the environment.

[00:06:25] On the EIT Food programme, we have received some excellent mentoring. It's also opened up new connections, it's broadened our networks and as part of our customer discovery journey, we've made some excellent new contacts. As a process, we've learnt a great deal. It's been an extraordinary learning journey for us. And the benefits are really very hard to sort of summarise easily. There's been so many sort of intangible benefits from simply getting the opportunity to interact with not just experts in the field, but also end-users. And we've really learnt a great deal in terms of what our product must be able to do for people to actually adopt it.

[00:07:12] My hope for the future is that the packaging industries start to adopt more sustainable solutions, that they will start to adopt bio-based materials which are biodegradable, compostable, and move away progressively where possible, move away from those oil-based plastics.

[00:07:35] My message to the entire food industry is that where possible, they should embrace bio-based packaging materials and other bio-based solutions. This will help forward the development and achievement of a fully circular economy. We must make sure that where possible, all materials used can be reprocessed, recycled or reduced.

Lukxmi Balathanan [00:08:08] Thanks for listening to this bonus episode of The Food Fight podcast.

Matt Eastland [00:08:12] To find out more and to learn how you can get involved in the fight for better food future, head over to eitfood.eu/podcast.

[00:08:18] For more information on AgriFoodX, please head over to agrifoodx.com.