

Interview with Participant P – 22.02.2018

Int: How long have you been farming for?

P: I was born into it. My parents were farmers in [REDACTED] and basically I got into potatoes after I left college a long while ago.

Int: Okay, a lifetime of experience, which is very useful. And what's the current size of your cropping area?

P: I'm wholly involved with potatoes within [REDACTED] obviously, so this year coming, 2018 will be just on gross area, about 550 acres.

Int: And is that land... I don't know exactly how [REDACTED] operates, is that contracted?

P: Rented, wholly rented.

Int: So you are basically coming in when people have potatoes in their rotation...

P: We go in, we rent the land and we grow the potatoes in their rotation, and the conditions we try and work is a minimum of 6 years rotation between crops, and ideally 8. So that's for disease reasons.

Int: And so you, just to understand the agreement with the people whose land you are using... you pay them a rent? It's not the case that they get a percentage of your profit.

P: No. Well, that's not strictly true. In one particular case we have a joint venture where we share costs and share profit.

Int: But that's not the norm?

P: The norm is, pay rent... we use the land, there's conditions we abide by, and then we leave that land. And the way I like to work is building up a relationship with that land year on year and that seems to be the most successful way as far as we're concerned, because you are working with them

then for common aims and certainly with the more pressure on environmental care, directives etc. etc it's important that we do. And we mustn't mention Brexit too much but that will become more and more important, that's obvious the way we are going on that one.

Int: So you go in for one year, but there's an expectation that you'll be working with them again, it might be that you'll grow potatoes on a different part of their land next year?

P: Oh, yeah, we'll be within their rotation.

Int: So it's not just like you are only interacting with people occasionally?

P: There is a, how would you say, the old adage was, you go in, you rape the land and you go away again, well that's not what we are about any more you know. We all want to do our bit to preserve the land, if we can improve it, it's a bonus, but keep it status quo.

Int: And so do they provide water, you are presumably using their licenses, and some of their infrastructure?

P: Yeah, so what we do with most of them apart from one we work with, is we pay them a price per Ha to apply water. So in other words we say, "Right, we want 15mm on that field today", and they'll go and do it for us. Alright? But then on one particular farm, we do all the... we have all the investment and we do all the work, and that's where we have all the sprinkler work. And that works pretty well.

Int: So that sprinkler work, is that... are you putting in permanent sprinklers?

P: It's a seasonal thing, we'll lay the pipes down at the beginning of the season in a set grid pattern and then we'll lift them at the end of the season when we've finished.

Int: And how long has [REDACTED] been operating on this kind contract farming approach? What's the history of it developing?

P: Well, here it started before I joined. I mean I joined them in 2008, 2007-2008 season. They've been obviously working like this a long while. I don't know how far they go back because, we have one big unit [REDACTED], and they've been growing since before [REDACTED] took that company on, it used to be [REDACTED], and that was the whole ethos then, so you are going back twenty, thirty years.

Int: So did [REDACTED] originate as a family farming business? Or do you know how the...

P: [REDACTED] rose from the ashes of [REDACTED]. It was a management buy out. They had the site at [REDACTED]. And then after that, [REDACTED] and also in the west as well at [REDACTED] near [REDACTED], and then within the management buy out they obviously got bigger because their customers were demanding more and they needed more, so yes, [REDACTED] was brought in, taken over and brought into the fold. And that gave us two packing sites, three sorry. So geographically there was a lot more importance and ability to supply, and that's what it's all about, a 365 day supply.

Int: And so to what extent does [REDACTED] try to influence the way that the landowners are developing their water supplies, or managing their licenses, or... do you have any...?

P: Well, we have a policy to improve where we can, and to look at new technology and to try and input into these farms wherever we can. It becomes more difficult when they are the guys footing the bill; they are having to invest in new irrigators, new pumps, etc. etc. But we advise. That's all we can really do. In our own benefits, we are able to demonstrate, you know, these sprinklers work for us and these are our costs, etc. etc. But we still use the guns as well. It's horses for courses. We have a duty, and certainly within the audits that we have to adhere to they are encouraging that anyway.

Int: So what would happen when things perhaps go wrong, in relation to water. So for example, do you engage directly with the EA in the areas in which you are farming?

P: Not directly, we belong to [REDACTED] which is an abstractor group, so we are indirectly involved with the EA there, but we also utilise [REDACTED] to advise us on water usage and that for crop development, so we are trying to glean information from as many places as possible.

Int: So if there was a hands-off flow imposed on one of the farms where you are growing potatoes, how does that cost, which could potentially mean you are growing a crop to a lower quality, or you get a lower yield, or there just isn't quite the water supply that you need. Do you then bear that cost or...

P: We do bear it.

Int: So you don't pay any less rent to the farmer?

P: What's built into the agreements is that we get first call on water. So if they implement section 57, we're all screwed! Excuse the pun. And that's that, we have to abide by that. It usually doesn't come at a time of year which is just as the potatoes are coming through, there's a critical time where, have you heard of potato scab?

Int: Yes.

P: Well, a lot of varieties get affected by it and if you get that on a potato it immediately downgrades it, and that's usually at the beginning of the season, May-June time. If you get through that period at least you've got that critical time out of the way. So then you are looking at... there's so many different things that affect quality, not just water. So water predominantly is yield-related after that.

Int: So once you've gone through the critical period for scab then you can feel confident that at least the quality will be okay?

P: You can feel better... the quality will be alright, but the yield will be impacted.

Int: And are you growing mostly for salad potatoes or...?

P: We tend now... this year, nearly 70% of our area will be salad potatoes, so it's about a 12 week growing season, so it's pretty concentrated. This year we've got a bit of processing and a bit of seed, but seed is grown on non-irrigable land. Whereas all the other land is irrigable for the ware crop.

Int: Right, what's the reason for?

P: Seed you don't have to get the quality in terms of skin finish or appearance, all you have to do is get to a certain size which is saleable, and avoid any diseases and viruses, so it's a different mindset for seed.

Int: And is that sold to other farmers?

P: Yep, it's government directed in the form of directors, but it's pretty strict and it needs to be to fill the quantity of seed.

Int: So it might be quite complicated to tell me about the different licenses and water sources that apply to the different areas you are farming?

P: Yeah, on every farm we've got... Three primary water sources is reservoir which I would think is now the biggest source as an average across the farms. Borehole and river would make up the other two. So we source it from virtually all, apart from out of the mains, which has been prohibited. So yeah. Some farms, like we have a block of land down at [REDACTED], that's 100% reservoir. Over at [REDACTED] which is on the East coast down near [REDACTED], depending on which year it is, we could have it from all three sources, because the system was built, or originally installed a long time ago, where the only source (or the easiest source) was out of the river. So stick a pump on the side of the river, and an underground main... depending on the pumps at the time, it wouldn't pump it very far, so an underground main was built to service that pump and then following that they put a borehole in, and that serviced another block of land and after that, they flooded an area, a low-lying area which was wetland anyway, and used that as a reservoir, so.

Int: So when you are thinking about land that you would want to go and grow potatoes on, do you have a preference... is there one water source that you think is more reliable?

P: Well, they all have their distinct differences, but we would prefer to go reservoirs because that negates, or can negate, the problem of being stopped from watering, because you've already filled the reservoir, that's your water. So that gives us a bit of reassurance. So that would be the preference, yeah. But you don't always have that luxury of choice.

Int: No, and would you ever, if you have confidence in a long term relationship with a land owner, would you ever assist them to add a reservoir or is there anything you would do?

P: Yeah. I mean we've talked about this with several landowners before, in that, you know, if we could have a long term agreement, you know say, you would have to be thinking long term in terms of about 10 years to be able to make that kind of investment anyway, but yeah, and it would be at the end of the ten years it would go back to the landlord but you would have had your, hopefully, your investment returned by then anyway.

Int: Okay, so you might be paying them a very much reduced rent for that period if you had put a reservoir in, or something like that?

P: Yeah, there would be some agreement that you would both benefit from.

Int: And have you ever had any experience of water being withheld during the critical period for producing?

P: We are very fortunate in that we are at the end of the line. In other words, if the water doesn't get used by us it usually gets pumped out to sea. So being predominantly on the [REDACTED] there, we are quite lucky. So I've never been in that position. When you are more river-based in [REDACTED] and [REDACTED] I think that's much more of a threat. But we are lucky.

Int: And in terms of sales, are you producing mostly for fixed price contracts?

P: Yes, within the [REDACTED] company, that's our main aim, it's to produce specific varieties for packing for the retailers.

Int: And so you are planting 100% for contract?

P: Yes, about 80% will go specifically into the fresh market.

Int: And you are not planting anything that you specifically plan to sell on the open market?

P: No. It's all contracted.

Int: And so if a water impact has caused a problem (or perhaps any problem, it would probably be the same in terms of the contract), are there any penalties specified?

P: Yes.

Int: So beyond you not being able to sell what you've produced?

P: Well, you've still got to meet the criteria that's directed to you, i.e. the quality standard. That's got to happen because that's what the consumers (we are told) want (laughs). So we have to meet those standard whether we've got 5 tonne an acre or 20 tonne an acre. If we can meet those, then as far as they are concerned, or as far as the packhouse is concerned, they are getting what they want. What we are not getting is the tonnage that we contracted for, which could in itself create a penalty, even though we are part of the company, create a penalty in that they would go out to the open market and buy that against our contract, which could be expensive.

Int: Have you ever experienced that happening?

P: Not personally, no. But I know several people who have. And it's a costly thing, because it normally happens in a year where there's less potatoes about so the prices are up. You know when there's plenty of potatoes about it doesn't usually happen.

Int: So thinking from the point of view that yields and quality are often weather related, moving to the future we know that we can probably expect more weather extremes, so you can perhaps expect more impacts on like grower's capacity to meet quality and standards, and to produce the amount that they have contracted to produce, so it seems like the growers are the ones that are responsible for paying for that cost, even though, perhaps, all of society is contributing to the fact that these impacts are going to be increasing. So how do you... do you think that?

P: There has got to be, it's one of my thoughts, you know you were talking about what my ideas for the future are, but it's one of my thoughts that generally speaking, I believe that the culture, the buying culture has got to change. If people still want fresh produce, doesn't matter if it's potatoes, carrots or whatever, I think the buying culture has got to change, and that's retailer-driven... to accept a lower quality, because the quality issues that the supermarket look at and the consumer look at are purely eye-candy. They are not looking at internal quality or anything else... taste. It's only just now coming back into vogue. Before it was just, "oh they look pretty, we'll have them!"... You know what I mean? There's a token attempt at trying to get some people call it, sub-standard quality, or odd-shaped vegetables, or..

Int: Wonky veg?

P: Wonky veg! I don't quite really go for that, but at least they are making a token attempt at it, but until we actually... Again I suppose it's educating the consumer, and this is where we come in ourselves. We are probably bad at it.

Int: Some people have said 'consumer is king and everything comes down to the consumer', but others have said, actually the consumer is just completely manipulated by supermarkets.

P: What do you think?

Int: I don't know! I think we are quite manipulated by supermarkets, we choose from the range that is presented to us.

P: From the range, yep.

Int: And we don't have very much time as consumers to shop around in different places, generally people go to supermarkets because they can get everything there and everybody's so pressed for time these days, that they need to get it done as quickly as possible. But one thing that was said about the wonky veg thing was that actually farmers have made such huge investments to be able to produce to the very specific quality requirements that supermarkets have asked for, that if there's now a move away from that, that will again not be in the best interests of farmers because they've made enormous investments in having very precise irrigation technologies that can produce to that quality.

P: Undoubtedly, but don't you think that as you say, major weather events will impact directly on that anyway, so we may not have a choice. To me that would be the way to look forward on it.

Int: So the move into producing more salad potatoes? What does that mean for irrigation?

P: It's less used.

Int: And was that a driver for the decision to move into salad potatoes?

P: It's part of a whole decision-making process. It does tend to be driven by land type, because obviously salads dictate that the land... you can grow it on lighter land, but it doesn't want to be on stony land, so there's quality of land, which this year we've got a lot of good sound land. But water is definitely a consideration because we know we've got a finite amount with the licenses we use, so you know if we can use less it means it costs less. And unfortunately that budget has to be met one way or the other, so you look at it favourably in that respect.

Int: And is the price... it's regarded as a specialist crop?

P: Yeah. Whereas normal white potatoes usually are on a fixed MRP price, in other words you are fixed with 50% and then an MRP for the other 50%, it varies... the percentages... but salad potatoes tend to be 100% fixed.

Int: So it's a strategy for reducing uncertainties about economic...

P: Yeah correct, because a lot of people, you'll know, but a lot of people have been caught out this year because prices are on the deck, so any free buy out of contract is worth nothing.

Int: So I guess traditionally I've been told that people were selling a lot more on the open market, or mainly producing for the open market and the risk was sort of... there were years where you benefitted a lot and years where you lost out, but nowadays, most of those that I've spoken to, very few of them are growing specifically for the open market... it could just be the sample that I've spoken to but I've only actually had one grower out of 15 who grows a significant amount that he intends to grow on the market. Why do you think that people have changed their approach?

P: Um. As a kid, growing up on a farm, there was always one crop which did really well, there was always one crop which didn't do so well, but the average was good. These days costs dictate that every crop you grow has to do well. There's no sort of averaging, and certainly with us, that pressure is far more, because we are only one crop. As we've said, we can grow different types of that crop, to offset the risk a bit, but we've got no fallback. So having a contract, well at least we've got a known return if we hit the spec. It's far less risky than the open market. But there are boys out there who say they are on the open market but usually have got (they're say, growing maris piper for chipping), but have usually got a client-base that they sell to year on year that are there.

Int: Yes, it does sound like they have to be very much on top of their interactions with clients.

P: Yeah, absolutely.

Int: So in terms of, [REDACTED] is operating on a large scale, growing on farms, just specialising in potatoes, do you see that increasing specialisation... is that business model becoming more prevalent in field veg production in the UK?

P: To a point. I don't think I'd be out of turn by saying that there is obviously a financial limit that they could run to. We are reportedly the [REDACTED], because we've got a big chunk of [REDACTED], big growing operation down in [REDACTED] and then three hubs here, and two in [REDACTED]. That absorbs a massive amount of capital, and it absorbs capital when, you know, it may not be the best time of year to have it, so there's a limit there that they can actually work to. So yeah, I think it would be capped, for financial reasons, rather than you know physical ones, if you understand what I'm saying. But our purpose growing within [REDACTED] is not only to grow potatoes that they want to pack but also to look at new varieties, and the impact of new varieties is they might be more water resilient, you know the breeding might be better. They may yield more for the same inputs, they may be able to cut fertiliser back, those sort of things, so there's all new varieties coming in, which we get a chance to try to before it goes out to the newer grower market, which is obviously important.

Int: Okay? Is that because of the relationship with [REDACTED] or...?

P: Well, with [REDACTED], they are predominantly seed growers, so they have the R&D up there, so and they are obviously tied to all the seed houses in Europe as well, and looking at new varieties and seeing the traits that they want. They've still got to produce this specification for the supermarket, but if there's benefits to come in both environmentally and financially, let's be having them! Simple as that really.

Int: So you've grown up on a farm, so you have a lifetime's worth of experience. What do you think are the main changes within the production of field veg in the UK?

P: It's gone from a small grower supplying local shops to a big operations, very slick, hard-nosed business operations, who have to work on high volumes and low margins really to make it all stack up.

Int: And thinking broadly about the resilience of the system, are there any risks in things being very business-oriented and very large... Do you see that as bringing risks?

P: A lot of things go round in cycles, and I can see those big units maybe breaking down into smaller units again and being more regional. Um...

Int: What would drive that?

P: Environmentally I mean we haul food thousands of miles. And I think that's got to change, because you drove down here, you know how much traffic's on the road. And a lot of that is lorry's hauling stuff, so I think that's got to change. We are not going to be able to afford that, let alone environmentally keep that up. Fuel in the next fifty years, god knows where we are going to be with diesel and petrol... Oil's going to run out eventually isn't it? So there's got to be thought put into that, so yeah, I think we'll go back to more smaller, regional, maybe governed by the same big units, but far more regional, smaller.

Int: So for [REDACTED], you are maybe not doing the irrigating, but you are doing the scheduling of the irrigation?

P: Yeah.

Int: So what are the methods that you use to make scheduling decisions?

P: Okay, well fundamentally we are looking at weather, and then we are looking at growth, in other words, we monitor the canopy of the crop all the while and that gives us a, or we feed that information to [REDACTED] and they've got a modelling system in which the canopy is 50% ground cover, the soil types is medium sandy loam, erm the water... They take it from a point where the water, there's no deficit, it's point of saturation, so we decide where that starts and from that point there's a deficit building up and then you take in the factors of rainfall and weather forecasting, etc. etc. and make a decision about when and how much you are putting on.

Int: So it's like computerised scheduling system?

P: It's a computer model, yeah, but it's got a massive amount of data behind it.

Int: And to get the canopy cover is that done on the ground by somebody measuring a few squares around the field?

P: Yeah, the young girl who's through there, I mean last year... she's not doing it this year, but last year she was doing that. She just used a metre grid, you know, 100 squares and that's done every week, so it's fairly intense!

Int: And are there any other methods you use in addition to that, like probes or...?

P: In the more outlying lands, [REDACTED] being one of them, it's a bit further away so the weather pattern can be totally different down there to what it is here, so yeah, I do, I use probes down there. So that's online so I can look at that as giving an extra thingybob. Um, we're also looking at satellites now, there's more technology being... or more money pushed in that sort of line of technology. I was just looking at a new system that's come in this year that actually has the ability to see through clouds, so you can actually see the fields on a more regular basis, because that was the hinderence before, because if you got cloud cover you just couldn't see anything, but whether it's UV or whatever I'm not sure. Anyway, we've got that coming forward so, yeah, there's several different methods of being able to monitor crops.

Int: And do you still sort of walk the fields on a weekly basis?

P: Yeah, I do. But for a lot of reasons. It's first having, as a back up. There's nothing quite like sticking a fork in the ground and seeing for yourself. Because there's been times when the schedule has said, we want to put 15 mm on, 20 mm on today, and I've gone into the field and said, "no way I'm putting 20 mm on here!". But at least it's a programme which is there and you can use it as per what it says, or you can use it as a guide to back up what you were seeing in the field. Because I actually do all the agronomy on the potatoes as well, so I do walk the fields for several reasons.

Int: And can you foresee a time when it won't be necessary to go out there in person and look at things?

P: Um, yeah the technology's coming now that if you have satellites monitoring the crop, you have computer models which can tell you exactly, I mean our own R&D are now working with [REDACTED]... they've developed this forecasting method where they can say, "at such and such a date, given these conditions we will have this yield and this specification", you know... "The right time of burn-off or the burn-off date will be such and such". So it's all there, and it's actually working out pretty well. So all those things are there, but... but, will we be able to see things like disease coming in, like aphids coming in. That's a bit more difficult. So... the actual physical being in the field on a regular basis, it's still valuable, I can't see that totally disappearing, because the sheer nature of growers these days is they want to be part of that growing and they want to see what's happening for themselves. You know, so... it may be less stress if you've got all this information coming in, so it's a much more pleasurable thing to walk your fields, but you know.

Int: I guess though that it's difficult if fields are very far away... I mean, what area are you needing to get to.

P: Erm, I suppose what we... We are about a thirty mile radius I suppose. It's not a big thing, I mean it's half an hour down the road. But if you are up to your eyeballs doing something, half an hour down the road can be you know out of the question today, and you've missed an opportunity if you don't get down there for another two days, so.

Int: So are there any other water-related risks that affect your business?

P: Contamination. It's always a risk and again we are sampling the water every year to make sure that we haven't got any issues.

Int: Okay, so you don't leave that up to the landowners, you do that yourself.

P: No, we do that. It's our responsibility, it's our crop, so we need to know we're being diligent in making sure what we are putting onto that crop is safe. And you just don't know. I mean water is an incredibly fascinating sort of medium really, because when we get these results you look at these and you think well, "what the hell does this mean?" [laughs]. But when you delve down, you look at it and probably what's the... staphylococci, those sort of really dangerous things, as long as they're in check and you haven't got any issues there, the rest are... we probably need them, I don't know, I'm not a scientist. But as long as the dangerous ones are at low levels you are okay. But again, it's checking, it's just checking to make sure we are alright.

Int: And things like water-logging... is it not such a risk around here because the soil's very light?

P: It can be, it can be... I mean literally this morning I was looking at one or two fields and there was one particular part of this field where the ditches haven't been done properly and that's actually saturated in that area and the reason why... I was actually talking to the farmer about it, and he said the reason why he can't do it is because the council won't clear their culvert under the road, you know, so he's stymied, we're stymied, and it's unlikely... we'll hire that field, but we won't plant that area because it's too much of a risk, both in vehicles getting stuck and messing up the land, etc. etc.

Int: And again would you ever make any long term investments in drainage or anything like that?

P: No, because drainage is a far more personal thing to the landlord, we can say, well, actually we're not going to grow that bit, but it's his land, he needs to be doing something, so it's his land, he needs to make his own investment. And to be fair, if I'm only on that land one in every seven or eight years, it's not viable. And for me to invest in that, yes you can write contracts to say that if I'm no longer here in 5 years I will get some recompense back, but you can drive a bus through a contract if you really want to!

Int: And can you explain what has caused the landowners that rent land to you to no longer want to grow their own potato crops?

P: Yeah, certainly all bar one were growing potatoes in the past and no longer do. The block down at [REDACTED], he was looking at potatoes and approached us to say, "I want to grow potatoes, come and have a discussion". We went and had a discussion and we put him off by saying, actually, this is what it's going to cost you to set up a potato operation, which I'm not saying it's prohibitive, but it's a massive investment, whereas we were set up, and that's why the joint venture was born, because we've got the infrastructure, he's got the land, so it married up very well. The others, [REDACTED], they gave up potatoes because with the amount of people they had to have on the farm just to cater for that busy time of potatoes as well as other things that they do on the farm just didn't add up. They were getting to the point where their machinery was getting old and needed replacing so it was a management decision to stop growing, and that, I think would be fairly similar to the other guys doing it that we grow on. Hence the reason why you've got these big units that um... every year... like this year... it will be interesting to see what the final planting figures are this year because people will have been hurt by this year being a low price year, and they are at the point where they have to invest in... are they going to grow? Maybe not. So they'll say, "Right, I don't want to grow potatoes any more", but some of the big units will come in and say, "Well, I'll hire that land from you". So the actual area doesn't change too much, the people who are growing it do.

Int: But the oversight of it is concentrated in a smaller number who can afford to make that investment.

P: Yes, I forget the figures, but I mean I think there's less than 2000 growers in the country now, whereas, 20-30 years ago there was something like 20,000, so it's a dramatic difference.

Int: So do you think that when farmers make big investments in irrigation that commits them to producing higher value crops moving forward, because they are in a position where they need to recoup that investment?

P: They... there has to be a good reason for investment in irrigation, and high value crops, as you say, is a reason, or renting the land out to have high value crops grown... where there's a repayment for the water. But it also helps them, I know virtually on all the farms we are on, that because the irrigation is there they will use it at times of stress, like this year, early on, on cereals as well, so it is... although we have this built into our contracts, that we have first take on that, they don't and we wouldn't expect them to, give us all their license. So there is an element of that water that they have in reserve that they can use on their sugar beet, or on their cereals.

Int: I guess they also need to manage their water so that they are not using too little of it because if they have time-limited licenses then those licenses will be reviewed at some stage...

P: Correct. Yeah, when we are on board, we usually make sure we use a lot of the water (giggles). Last year we used a lot of water.

Int: So you say you are in [REDACTED], have you therefore ever been involved in undertaking any voluntary restrictions on water use, or is it the landowners who would...?

P: It would be the landowners. Well, we'd obviously talk about it, because it could impact on us, and the obvious thing would be, we need to take restrictions this year, so we'd cut down the area a bit to fit in with that. So...

Int: Do you generally have enough warning to know that you're going to...

P: I've never been in that position to be honest, to know that, but yeah, I think we erm, I'm just trying to think if I have had this conversation, but I think it was a 'what-if' scenario rather than what was actually going to happen. I don't know is the answer.

Int: Okay. And so [REDACTED] is packing it's own potatoes

P: Yep

Int: And then selling them on to retailers?

P: Yep

Int: How do the retailers seek to influence the water that's used to try to grow those potatoes, do they do anything? Do they take an interest in any way?

P: Ooh yeah... Mmm hmmhmmm. Yeah, the supermarkets want to appear to the consumers, that their public has been whiter than white. That they are addressing issues which the consumer feels important. And obviously water, I mean I don't know what you think of water, but as an island, I know we are surrounded by the damn stuff, but water I think is a more precious commodity than some of the mineral deposits we have, because it's a finite resource, isn't it? And the more we houses we build, the more people that come into the country, the more water is required, and the more water that has to be distributed between the entrusted stakeholders. So yeah, the supermarkets have to be interested. And we do get involved with projects. We've had big involvement with a Sainsbury's project, where they were looking at more efficient ways to put water on and they funded some of the research into that. So yeah, they have an interest, definitely.

Int: At the beginning you said, "they need to be seen to be taking an interest", do you feel that it's to some extent a little bit superficial... their involvement?

P: [laughs]. Um, I would be wrong to say that. There are people within those... um... empires that are really keen to have a real impact on those things, I would hope it would be wrong of me to say that they use it just as a selling tool, but I think the boys at the top would say that, yeah, "that's a tool for us to have an edge on our competitors". But if they are willing to put money towards it, so if they put 50% in and we put 50% in, through AHDB or whatever, that's good. Whatever motive, that is good.

Int: Yes, it's a good impact. I guess if it's not a deeply held value then it depends on the context, on the wider political context that's driving their behaviour.

P: Well, I mean, you know the emotive impact we are now seeing with retailers... Iceland have come out and said they are going to reduce their plastics. Well, everybody will feed into that. I know Tesco's are already doing their own thing on that, you know, on the packaging we use. I'm disgusted with the amount of packaging that we have to deal with, and it's all wrong. But because of the consumer suddenly.... Er David Attenborough and his thingybob, it was there, it was in the public eye

and suddenly the whole thing was elevated and it has driven people to do something about it. And that's what's going to happen with water eventually.

Int: At the moment do you think consumers have any awareness of the water used to grow their food?

P: Er. They read about it, but so long as there's water coming out of that tap then there's not really the emotion involved, is there?

Int: And I guess going back to the first part of the project, there's massive implications about where we source our food from, so if we are getting our potatoes from Egypt for example that's having a huge impact on water scarcity somewhere where water is in very short supply. But it seems like ultimately that doesn't really impact on the prices that consumers are paying, so there isn't any very clear stimulus for them to choose one thing that's more sustainable over something that's less sustainable. If you think about the system as a whole, do you think that there's an obvious stakeholder that should be in charge of that, as in we have retailers, we have government, we have farmers taking responsibility for their own actions, we have consumers purchasing certain things. Do you think that the responsibility for trying to increase sustainable water use in our food should rest more firmly at the door of one of those stakeholders, or do you think everybody has to play their own part? Or put it another way, who has the power to do something about it?

P: I don't think it ought to be any one particular faction of the business, because we all have our own take on it, the retailers would have a totally different take on water than we would, because they are dealing with god knows how many thousand items on their shelves, whereas we are just dealing with one. So we will always be told what to do with water. Yes, I think there ought to be a body that ultimately has the power, not just for growers, but right across the board, to be able to dictate what should be done. Yeah. And I suppose the obvious one is the Environment Agency, because theoretically they ought to be unbiased. They are just looking at a commodity which needs to be utilised for all these different factions and they need to distribute it accordingly.

Int: But it would be difficult for them to have oversight on what we bring in from other countries do you think?

P: But why? I mean, you found the information, so why shouldn't they.

Int: I guess at the moment their remit is just to be in charge of...

P: Yes, but that would have to change wouldn't it.

Int: So you think they should have a broader remit? So you think we should have a body overseeing the imports that come to the UK and making some kind of...

P: They are ultimately responsible to the government. The government, they are in charge of the relationships between these other countries. And there's more than just water involved in these countries. I mean there's an economic reason why they want to sell potatoes or any other vegetables to other countries... it's money back in their pockets isn't it. So there's a lot of other factors. So ultimately I suppose the EA would be involved say the EA could govern it, but they are responsible to the government, who again, should be unbiased [laughs].

Int: And do you think that there's any chance the government will be taking more responsibility over the next few years?

P: Well, they have to. I think they have to. They are a voted representative of our feelings, so they should be.

Int: Hmmm, it's difficult!

P: It's very difficult. It's easy to sit here and surmise, but I just think there's so many other political reasons why decisions are made, and we focus on one thing, but the amount of horse-trading that goes on, erm, for all the right or the wrong reasons.

Int: It is a complicated business, definitely. So thinking about field veg production in the UK and resilience for producers, is there anything that you can think of that could make growers more resilient to water risks?

P: Yeah, I mean the work we do with varieties I think is really quite important. This will bring in GM, but to me going forward we need to have seed or plants which have a built in ability to use less water to produce the food we want. That would be my thought that there ought to be more investment in that. But it would have to involve genetic manipulation because, not that we haven't been doing genetic manipulation on all our varieties for god knows how many years, but it would have to be accelerated. So if we got potato varieties, carrot varieties, vegetables in general, that don't require so much water, maybe enhanced with that, varieties that don't require so much erm chemicals, so all that going down that route, to me that's one of the most important things going forward.

Int: And what about other options like wastewater reuse, is that something that you think would have... as in coming directly from sewage treatment plants and that water being used directly for agriculture rather than being put into rivers?

P: If it's practical to do so, yeah, and if it's safe.

Int: At present I guess the infrastructure isn't there to permit...?

P: Indirectly it is I suppose in that they are putting (we hope) safe water back into the rivers which eventually turn round into irrigated water on the land. But there probably needs to be a lot more work done on that.

Int: And something like drones, is that something [REDACTED] would be thinking about relying on in future?

P: To do what?

Int: Instead of relying on satellite imagery, using drones to fly over fields to get the canopy cover photographed or measuring radiation.

P: Um, drones have a use. I'm not convinced that they are as effective as people make out. I think there's probably more effective ways. They're good toys! [laughs]

Int: Yeah, they look quite exciting anyway! I do feel like I'm living in some kind of... bladerunner when I see drones in the sky when I'm going for a walk.

P: Absolutely! There's the safety issue with them as well which I don't think we've fully grasped yet, but er.

Int: Right, I think we've covered all of our questions... do you have anything else that you think is an issue that you want to raise?

P: No, I mean I'm quite looking forward to seeing what the outcome of this actually is, because it's the first time there's actually been some in-depth work to this degree to pull in all the different facets, not just, "is your irrigation efficient enough?" or "are you up to date with what we are

doing?", you are actually pulling in a lot of work there, so I'll be really interested to see the results of it.

Int: Ah, thankyou!