

Int: I know that you grow potatoes, carrots, onions and also a range of organic veg, sugar beet and cereals. Is the irrigation mainly just for the veg?

A: It's there for anything. Initially when the irrigation was put in here in the early sixties it was put in for everything, it was cereals, sugar beet and potatoes and carrots at the time.

B: And beans.

A: Sorry?

B: Beans?

A: Not in the sixties, no. But probably cabbages and things like that. There wasn't Tesco's in those days so, my father when he started here, they came in 55 or something, the irrigation didn't go in until about 64, but it was crucial to be able to produce a product to be able to take to Covent Garden really. Lorry loads used to go up, cabbages, carrots and spuds, and bearing in mind all of the potatoes went in a bag off the farm to the market. And the crucial thing at that time, or the difference between then and now, see you needed to water to make sure you had a crop to harvest, that hasn't changed, but what has changed is we are trying to create quality, and you don't get any quality without lots of water, so it's two different things. One thing we were producing a cabbage or a carrot or a spud that went to Covent Garden, there was different grades of quality but you'd always get a return, but now, everything has to be perfect, otherwise nobody wants it.

Int: So you've moved away from just trying to avoid crop failure towards being very precise about exactly what you grow for what purpose.

A: Exactly, so coming back to your original question. If we've got enough water and we are going through a dry spell, I will still put it on sugar beet or cereals. I don't actually grow, we've just stopped growing cereals here, but talking in the broader sense of some of my other contract farms that we manage all the water on, there is occasions, last season for instance, where we did put some water on some cereals and some sugar beet. It just makes a huge difference. On our light land growing a barley, whether it be spring barley or winter barley, you can get total failure without water, and nobody wants a total failure. So just one or two applications can give you a harvest. And it's as fine as that, you know you spent all that money on it, and you've paid your rent and you have all your overheads, to just watch it go to waste is an awful thing to do, and you have to think about today, as well as what might happen in three months, and we've been there before where you think, early in the season, you think I'm not going to waste the water on that, I'm going to save it til later, and then it rains, so you think I could have actually had a crop all the way through, so there's certain crops you have to make sure you hold back enough water for, but other crops you have to look after right from the beginning, because if you let them get too drought stricken you'd never get them back again. It's a real fine line, and it's something I discuss with my team on a daily, weekly basis. You know... what do we do now? And it's fine where you are in a situation where you have huge volumes of water, and then the issue becomes actually physically being able to get around everything with the equipment.

B: But the decisions... Last springtime we were in a situation where it was dry, crops were growing in the ground without either being drilled or planted where they hadn't got sufficient moisture to establish. And decisions were having to be made at that time do we water sugar beet for arguments

sake, or do we water the onions, or do we leave the onions alone or do we leave the sugar beet alone, and do we go after the potatoes which had probably just got established but they got to the critical stage from a quality point of view and for scab control and those sort of things, if you are tight for water supply in a normal year, last spring will have led to a great deal of head-scratching and heartache, because people did walk away from cereals to make sure that they had water available for other crops.

Int: And the cereals are lower value than the others?

B: Well the cereals potentially have a lower commercial value at the other end in terms of net margins and gross margins and whatever, but the guys who walked away from cereals in the springtime, they never really came back, and some people harvested a ton and a half per acre. Other people who had the water kept the cereals growing through that dry spring period probably doubled their yields in the process. And it's currently, I would say, most of our farming membership of [REDACTED] have got sufficient to look after their high value crops, but there are times when they will make a decision, we are dropping cereals, we are dropping sugar beet, we are going to concentrate on cabbage or carrots or whatever it might be. And the others will take their risks, now sugar beets a very long term crop, and actually if it's established you'll usually get a return the other end, even if you don't water it. You won't get a good return, but you'll get something. Cereals, if they've lost it in the spring, will never come back and you'll end up at 1.5 tonnes an acre or whatever it might be. Sometime during the summer sugar beet will get something which gives it a chance to recover. Now it won't be a bonus year, I mean you know we've got chaps in Norfolk now who are talking about 100+ tonnes per hectare of sugar beet yields, who didn't water their crops. If you'd done that down here you wouldn't be able to get a 100t per ha of sugar beet, I can assure you.

A: There's one or two who have

B: Even now?

A: Oh yeah, I had one who did 110 tonnes/ ha without any water and he harvested the last week of September

B: Good grief.

A: But that's sunshine that has done it this year. But the one thing Chloe that I do, it's the most important thing we have - our contracts with multiples like Tesco's. So that covers all potatoes, all onions, except our seed potatoes, we don't irrigate seed potatoes, and all our organic crops. They are the most important things we have, and so you have to protect the contract you have. Otherwise you'll have somebody saying, I'm not going to let [REDACTED] farms grow this next year because they've let us down this year, they haven't got enough water. So they absolutely prioritize what we do. So there's no decision for us when it comes to getting onions to germinate in the spring or sugar beet... Bugger the sugar beet! (Sorry)

Int: So is the importance of those crops that are highly dependent on irrigation increasing over time in your business? Are you increasing the proportion of your overall income from those crops?

A: Yes.

B: And also, just going back to the customer base, the supermarkets are taking the predominant proportion of most of the product going out of this area nowadays because there's very little going into general market. There's quite a lot goes into... well I say there's quite a lot, there's some, potatoes go into the processing outlets. But the predominant outlets are pre-packers for

supermarkets, and the supermarkets supplier audits now look at water availability. They will look at individual farms, or if they are in a co-operative marketing group, what the supply of water is on that mix of farms to make sure that they are totally capable of supplying whatever their arrangements may be.

Int: So to win a new contract you need to satisfy the retailer that you have sufficient water available and that you have the right methods for irrigating.

B: Yep

A: According to their protocols and everything else, because they won't... they will never let their customer down, and when they do let their customer down i.e. the British housewife. If they let her down, the Sun's got hold of it, the Daily Mail's got hold of it, and everything goes to rack and ruin. And that's, not only that, the government doesn't want to see a situation where, it's hell-bent on not seeing a situation where shortage of food causes food prices to rise, because food inflation is not something they want to see. It's one of their major sort of worries at the moment. Because if we get to a situation like we did, what was it we were short of in the spring of last year? It was something out of Spain...

B: Spanish salads, yep

A: Spanish salads, suddenly there wasn't the volume about and prices did lift quite significantly and there were empty shelves and it was a major story.

Int: The courgette crisis

B: That was part of it, yes, courgettes in particular. So, and I mean, at current levels, that is on the cards for Feb, March, April, or April May June of this year, because the Spanish guys have not got water at the moment, and normal sources of water have not been switched on to any extent.

Int: So does that, when they are not able to supply, do you have veg in storage, or do you have any at that time of year.

A: No, [REDACTED] was specifically talking about salads, and we are both involved with [REDACTED], just from a board point of view, [REDACTED] used to be involved with growing salads, but we've not really done that. But yes, they end up in a situation where they try their damndest... they do everything to mitigate failure. But there will come a point where they will have to go to America or somewhere and buy in Icebergs, for instance, which is very costly. There's two things. One they try to protect their contract for future years, so they end up coughing for a lot of it, but actually, some of the supermarkets that aren't so committed will have to pay the uplift in costs, to pass it on to the customer.

B: There aren't many years go by where there's not the odd plane comes from California, just to make sure. I mean I'm not close enough to it now, not like I used to be, but it would surprise me if in the next 3-4 weeks there isn't the odd plane that's ordered out of America, just to keep things ticking over.

Int: Yes, so you were saying that most of what you produce is on contract. Do you aim to produce any surplus to sell on the open market?

A: No, everything that we put in the ground has a home. Alright, we allow for an average yield, and if you get an above average yield then you have got surplus without trying to.

Int: Is that true of most farmers around here?

B: Generally speaking. In this area though generally speaking most of the product has got an outlet before it goes in the ground.

Int: So by chance you may have a good year because the sunshine is really good...

B: Yep, if your yields are above what you've budgeted for then you'll have it. I mean some of the potato boys still have in this area there are some that still have fifteen percent what you might call free buy available, but generally speaking its contracted and its contracted based on an average yield over the last so many years of what they would expect given normal circumstances. And it will be based on a certain quality regime as well. So they are expecting to reach targets, and obviously they can better them if the weather's right. Or they can be slightly below, but if you struggle at least you've built in a 10-15% margin somewhere that would cover you. It's... there are other farmers who are growing potatoes today who don't contract more than about... they are at the other end, they only contract 10-15% and...

Int: What determines which you would do... is it just an appetite for risk or...?

A: Yes, that's it... well

B: Yes, it's an appetite for risk, and the ability to be able to market correctly and properly into those other avenues. Some of the people who've got fixed contracts might be doing a heck of a lot into fish and chip shops, and that's a huge market place still, but it's a complicated market place, you are dealing with it on a day by day basis mostly and regrettably still a lot of it goes in bags, so it's still a big handling issue.

A: Yes, some people are kitted to do that. But I would never do that. Most of our potatoes go straight off the field, so you have to have a programme in place where you know which field is going to come out next and which customer it's going to go to, and when that potato is ready to go it needs to go because every day it sits in the ground when it's ready, it's deteriorating in quality. So we make sure we are totally contracted, and I want my business to have a fairly flat margin if you like. The guys who don't have contracts, they go up and down like yoyos [laughter], there's people sat there now can't sell their potatoes and they'll have the most appalling year. And there's somebody else who's got a contract who might not get a lot for it, but it's all gone at sensible money, so he won't lose out. But some of these guys, that's just how they are, they've always been like that. But you cannot do that unless you have storage, so if you put them into a cold store in October at least you have the ability to be able to hold them and market them until maybe May next year, so you haven't got a daily or weekly when you need to ship them, which we have on our fresh stuff.

B: But they are adding cost by the day.

A: Oh, they're adding, yep.

B: So the price is going...

A: But it takes a little bit of that risk out. So the one thing, if I didn't have a contract today to produce any potatoes or any carrots or anything like that, I would really struggle to go and find somebody to back me now, because they have the packers, they have, the contracts not with Tesco's, it's with a packer in the middle. So erm you know, onions are all contracted to somebody and the potatoes go through a company that markets to several different outlets, um, and the organics we, basically we've done all the marketing ourselves, and it's taken ten years to get to

where we are now with the organic side of it. It's hard work sometimes, so you can't... if I suddenly started this business and said right, I've got all these thousands of tonnes of produce I'm going to go out and sell it, I'd struggle.

Int: Yeah, to some extent those relationships... develop over time and it's not easy to find...fresh openings and new ways in?

A: They are really important

B: Yep... and you need to build that relationship you've got to be able to prove over a period of time that you can produce the quality and the quantity on time. And the other thing that, whilst we talk about contracts, a lot of them aren't really contracts, they are agreements to supply to a certain level at a certain quality, and the day you don't, is the day you start next year's negotiations get harder.

Int: Yes, this was actually, moving onto another area that I wanted to talk about was, if you have a really, I was going to say caused by a water risk, but I suppose bad years are...

A: Well it could be... No, they won't come back. You'll get blackpooled. They can't afford to do that and that's why we can't afford to grow stuff without having the infrastructure in there and the water to achieve our goals, I mean don't bother.

B: And most farms in this area I would say are growing risk crops and water demand crops, they are growing them to the volume of water that they've got available, and that's probably, that's not the only limiting factor, but it is a big limiting factor. So, you know, we've got amongst all of our membership we've got everything from turf growers, to sweetcorn growers, to potato growers to carrot growers to cabbages and everything, and for a certain period of time, this relatively small part of [REDACTED] is pretty vital to the UK's food chain, on different crops, and it might be swedes one week and it might be potatoes another week and it will be sweetcorn at the end of the season and things like that. But all of those crops will only be grown to a certain volume, or a certain acreage or hectareage or whatever, because the farms concerned have got water supplies that they have dedicated to those crops.

Int: So you are running a really tight ship where basically everything is pretty much allocated and you are producing to that quantity and you have the contracts there, so if um, so you presumably don't have any way of insuring against a loss, but supposing you have a catastrophic, either more than one year of drought, so you've used up your reservoir supply, or you have severe waterlogging so that you lose everything, what have you got built into your business to mean that you don't go under within one year?

B: I've put reservoirs in.

Int: I mean, do you look at your finances and think we need to have enough to get through this year in case of a catastrophic season?

B: No, we have enough to get through every year generally, and it's never happened in my time, we are quite close to the river here, and generally we will have enough flow at some stage during the winter to fill a reservoir, we've never, never gotten in a muddle on that, touch wood. And I can't foresee that happening because um...

A: But that doesn't mean that there aren't farms in this district who are only literally one year, well, no, everybody's probably only got reservoir storage for one year, i.e. they've got winter abstraction licenses, fill that reservoir, and that reservoir is sufficient for a year. ■'s case is okay, I suppose in that until now, most years at some point there's been sufficient flow in the river to grab that water, stick it in the reservoir and he's comfortable for the coming year. There are cases at the moment which have come to light this year within the last few weeks where people haven't started filling reservoirs yet and they are now beginning to think, ah! I actually haven't got enough pumping time left to fill my reservoir.

Int: And that's because the river levels...

B: Because the river levels have been low and the flows have been down and, you know, their hands off flow criteria in their abstraction licenses have said, you can't start yet, and that is beginning to have an impact now. It had an impact last year in Sussex, err, but I think they just about got through down there this last season.

A: We've got a reservoir we can't fill at the moment, or not very well, because the flow's not there. It's been better this week because we had two inches of rain, but err, yeah.

B: There's been other people who've been told, there's been one of our members who's been told he will not get water this year.

Int: And so do you think that winter water availability is becoming less reliable over time?

A: It's climate change that's doing it... If you look at just this year, even though we've had ups and downs and all sorts of weather during the summer and the spring and everything else, I didn't think there was any issue about us getting average rainfall, but we are actually err... our average rainfall when I first started farming would have been 22 or 23 inches. It appears the last few years we've had 25-26 inches. This year we are not going to hit um 20 inches, just about 20 inches.

B: We are roughly 82% of the long term average I think.

A: But that's not, it could change in the next week. But yes, it's October and November that's really changed it. Very low rainfall when you expect it to be wet. November in particular, 3 or 4 inches you'd expect and we had an inch, so...

Int: I guess it's difficult because there's so many oscillations in how rainfall goes, you have a long term average, and then every ten years it shifts and then there's lots of different impacts and I read in the news this morning that there's a study that suggests you'll be able to predict wet summers better on the basis of the temperatures of the...

B: Pacific or something like that...

Int: Yes, so that would be at least a bit more reassuring for farmers, but I was going to ask you about, in relation to that... the EA assess your licenses every 6 years, is that right?

B: No, last time they went through most of the time limited licenses in the ■ Water Abstractors Group were um renewed to 2026 and that was done in 2015, so it's every ten or twelve years, and there are licenses that have just been issued this year that go out to two thousand....

A: it's 26 as well, I've just done two.

B: Yeah, you've just done two. But somebody has got them out to 2032.

A: Oh good grief.

B: So there are...

Int: So it's not all the same within the catchment?

B: Normally they should be, normally within the catchment they are coterminous, so that they actually deal with a catchment at a time, umm, but new licenses can finish this current round and go to the end of the next one, so there will be cases, so I think ■■■'s just got one that is a lot longer, and I think ■■■ has as well. But they've had to put a good case for it, they've had to say, look, we can't do this unless we've got a twenty year license, because of the investment we are making. So if you are going to put 1.5-2 million pounds into a new scheme which includes a reservoir, underground mains and delivery, automation monitoring and everything else, you can't do that unless you've got a license that's going to justify that expenditure for at least twenty years. So there are twenty and twenty two year licenses being issued, but they don't make a lot of noise about it. Purely because, you know, it's one of those things that you've got to really sit down and do your homework before you make that application. But to say that they are all six year is not correct.

Int: Okay. And are your (to A) licenses all time limited?

A: Yes, all my licenses are time limited. I do use a license on another farm that is a license of right.

Int: But that's in a different area?

A: Yes, it's chalk bore, but of course that doesn't really make any difference where it is, the EA are trying to get rid of them.

Int: Right.

A: Well, they are not trying... I have to say, the EA are hopeless, they hardly know which day of the week it is sometimes.

Int: Yes, I was going to ask about whether you are happy with your license allocation?

A: I'd like more, but it's a waste of time even asking for it.

B: It depends on where you are.

A: Well, yes. What we would like is to actually have access to high flows during summer, you know it's a bit of a no-brainer, but sometimes they won't come to the table at all. We do have good relationships with the EA now, you know 20 years ago they were like policeman, but they are not now they do come and talk to us. But nobody, but nobody can make a decision about anything. They keep passing the buck.

B: They keep passing the buck. The other thing that we are now dealing with is that, regrettably, I can understand part-time working and everything else, but you talk to one person on a Monday, you have to talk to somebody else on a Wednesday and somebody else on a Friday. Because they are on two day weeks or three day weeks. Now that's understandable, and if it's well-managed it's okay, but the problem is they are so stretched, the person who works Monday, Tuesday, Wednesday has got all their time devoted to one or two things, and the person who comes in on Wednesday, Thursday, Friday is on two or three other things, so that they can say we're covering both these jobs. But actually, they are not. They are only half covering everything else. I sent a comment in the

other day which I needed an answer on within 24 hours, and I'm still waiting. Four days later. Four WORKING days later. So there are things like that where we need to jump and we are unable to jump because they can't respond.

Int: Well, it's very time critical isn't it?

B: But A is quite right, the relationship has improved no end because we can sit down and talk. But sitting down and talking means one thing, getting the action, or the responses that are required, or the explanations as to why you don't get what response you want, is still not an easy job.

Int: And why do you think the relationship has improved over time?

A: I think historically they tried to do things with an iron rod and they didn't get as far as they thought they would.

Int: Okay, so they have had a change in...

A: And whatever we say, the people on the ground at the EA are not at all practical. They have no idea how an irrigator works. What's involved, how much water is required, all those things, so you know, so we've been through a situation where we had, I think it was in the late eighties/ early nineties where we, no maybe it was the end of the nineties, we'd been through two or three dry periods and they tried to say right okay you guys can only pump every fourth day and you can only pump six hours, you think that is no good to anybody because they don't understand the irrigator might take 24 hours to do a run. So six hours is hopeless to everybody, but it's about sitting around the table and working out how we can make it better for everybody, and they've done that. They've taken on knowledge if you like and kept us a bit happier. The bit that really annoys me is, it's very difficult to um... They do everything on historic volumes if you like, but actually, it's very difficult to justify having enough water in the reservoir in case have a dry... two dry years. And they don't see that, they can't understand that. All they'd say is, oh you've got all this license and you haven't used it. And I'd say, "No, no, no. It's sat in a reservoir there waiting for that dry day". But they don't see it you see, they just say, "But you haven't used half your license, how do you justify that? Let's have it back, give it to somebody else". It's just crazy.

B: Well, you know, there's certainly... There is an environmental pressure that's come through the water framework directive, and it's saying there's no doubt that there is a no deterioration factor in it, and there's a precautionary principle being applied. And that is causing quite a lot of strife when licenses come up for renewal, or whatever it might be. And the EA have made no bones about it, if you haven't been using your license they are going to take it away. So if you haven't used it for 10 years, you've had a letter saying either produce your justification now, or jook that's gone. No more. Doesn't matter what it was issued for, doesn't matter why you originally applied. You haven't got it, it will go. In some cases people have been able to say, "Woah, hang on. I haven't used it because...". And they've said, "Okay, we'll talk to you about it". But they haven't got staff to come and talk to you about it, so it just sits on the books. But in other cases they've just said, "No. It's not used, therefore it's gone". And they've removed those licenses and that water has not been redistributed, it's been kept in the system for the environment. And one of the biggest issues that is looming, I think, is that whether we like it or not, we've got climate change, and therefore the environment will change whether you allow more water in the rivers or not. And they are not recognising that fact. They are saying, "1995-2000, or whatever period they wish to take. That's what we consider a river needs to be of good status to meet the EFI's. And they've not acknowledged that actually if climate change is doing as they've said it will, we will gradually move to a flora and fauna that is less reliant on current water availability. And we may or may not become like Southern France, or Southern

Spain, or whichever latitude you wish to take it to. But in the meantime they are trying to maintain something where we were receiving 20 odd inches of rainfall as a regular thing, when we see a three or four inch decrease in it. And that is not... the two don't fit.

Int: They are not flexible enough?

B: They are not flexible enough. Well, as A was saying, a lot of our farms have winter abstraction licenses to fill reservoirs, and then they have a summer abstraction license for straightforward immediate irrigation. And those that have winter would have a more resilient ability to keep their crops growing if they were allowed to take high flow summer water.

Int: So you are not allowed to use summer water to fill a reservoir?

B: If your license doesn't say so...

A: Well, you can and we do, but...

B: If your license is not a 12 month year round license, you can't do it, and also, summer water is more expensive. They've priced it at a higher level. Which is, okay, so it's scarcer at that time of year, therefore it should be. Although, there's an argument saying if it's come down in a sheet, and it's going to go straight out to sea, why can't we have it? Because so long as we don't take more than...

A: The river's here... I don't know which way you came in... The river's [REDACTED] that way, and it goes [REDACTED] that way it goes over the lock gates into the salt tidal river. We're the last abstractors. You know... And we've just had a week, alright I haven't tried to use any water, but you couldn't actually get to the pumps because everything's flooded, you know. And they just don't even think about it.

Int: I guess with climate change we can expect more extreme events...

B: Well this is it. We are expecting... we are expecting to have high flow events on a more regular basis, even though our rainfall overall might not be greatly different, but if we are going to make ourselves more resilient, we need to have access to that high flow water. And whether we, I mean we are trying to work a scheme now where we are hoping to do that, but I'm just getting you know...

A: Just coming back to the original part of the question where we started... There's a huge number of licenses of right in this part of the world where they've never been used to their maximum and they never will be used, but they have a value to the estate or to the farm in case they ever want to sell it. Um. In my view they shouldn't hang on to them if they have a hideous amount that is never going to be possible to be used. All they do is restrict other people who need the water, and that's not right. It's really not right. But I don't know how they move that forward.

B: Well, the only way that that could be got round is by having better, simpler, quicker trading arrangements; i.e. you or whoever can go that person who has that license and say, can I have your water for the next six months or twelve months or even five years, if you are not using it, can I at least have use of it. Now okay, that's not a long term answer to your question, to your long term business plan possibly, but at least it gets you somewhere. In the meantime that guy hasn't lost it, or he may have lost a percentage off the top, but he's still got that asset sitting on his book. And one of the major issues I have with them trying to take licenses of right away is that whether you like it or not, there's plenty of farmers that have got bank loans or other loans hiked against the value of their property. If you take the water off you can reckon it's a minimum of £2000/ha gone off that land. So, there are... I think there will be a tremendous legal fight from a number of people, and

that's why licenses of right are generally not being mentioned too much by the Environment Agency, because they've not got the stomach to take it on board.

Int: And they don't maybe have very much leverage to do anything about it?

B: Well, they probably have. If they run the environmental side of it, and are sensible about it, they could certainly reduce some of those licenses even if they didn't remove them. But it's not going to be easy. And there are a lot of people like A who are on time limited licenses and one thing and another who could use a lot more water and need from the resilience point of view to have access to more water, because as I said before, most of the reservoirs around here are one season only. There is probably the odd one or two that would give the opportunity to go two years, but not many.

Int: And do you think that if you were to build bigger reservoirs your license would permit you to fill enough to be able to withstand more than one season?

A: I don't know. If I went back to them and I said, "Look, let's have another 50000 cubic metres or something, I don't know what they'd say"

B: I don't think you'd necessarily need to do it that way. I think if you had a bigger reservoir over a period of a couple of three years, if you weren't using the water for irrigating you could probably build it up. Now, just in the last four days I've had a case brought to me where the EA, on request from Natural England, are saying, your reservoir will only be of this capacity, and your license will be the capacity of your reservoir. So they are actually flying in the face of everything that DEFRA and London are saying is what we want to see.

A: Sorry, explain that again.

B: They've just, not too far from here, have said your reservoir size will be X and your license will be...

A: They are applying for a new reservoir...

B: They are applying for a new reservoir, and the license will only be sufficient for the reservoir and the reservoir will match the license.

Int: So normally licenses permit you to take as much water as you can so long as the river is above.

A: Well, no you have a maximum amount you can take, in a period. Okay. And it's usually based on...

B: Yes, you have a maximum amount. Your license says you can withdraw this much water in this many months, and you are only allowed to take a certain number of metres per second. But up til recently, as far as I was aware, if you applied for a million metre reservoir, you got a million metre reservoir subject to planning permission. Nothing to do with your abstraction license. But this is a new one that just came out of the woodwork on Thursday afternoon.

A: I wouldn't think they'd have a leg to stand on have they?

B: Well, I hope not because if they start pulling that one, there's going to be a lot of grief flying around. I mean, it absolutely.

A: I can put in a reservoir as big as I like, even if I can't fill it up. That's naff all to do with them.

B: Well, that's what we all thought, but they are trying one. And there's another one coming out, there's two things. You know you used to be, when you had a license, the license stipulated the land on which the water could be used. That was done away with in 2001-2002. But it's suddenly crept back into the system again, they are going to say where you can use your water.

Int: Yes, if you have the water available you wouldn't be able to expand it...

B: You wouldn't be able to expand it onto another farm or into a...

A: Well, you can apply but then they'd charge you a fortune and you'd have to go into all the rigmarole of changing your license

B: But they're actually starting... and to my mind... that is now becoming direct interference with the management and day to day running of a profitable business. And if they start dictating that sort of things they've got problems.

Int: It seems like they are limiting your decision-making capacity, which in a shifting environmental context...

B: Well, we need to be building... You know, you've come to talk about resilience. I think this year has been a bit of a wake up call and if it continues as dry through this winter as it was through last winter and so on it will be a major wake up call. And we need to be understanding how we can build resilience. And building resilience is having the capacity to store high flow water to use in low flow periods. And it's not just to use on crops, if it's stored correctly and used correctly it could actually supplement flows in rivers. And even now we are storing water... Public water supply has an obligation at certain pumping station where they've got licenses to supplement flows, and the [REDACTED] is one of the rivers that they supplement. Public water supply ships water out of Denver sluice in Norfolk into the River Stour in Essex, through a damn great pipe and over ground canals and so on and so forth. So we are already doing some things, but we've got a lot more that we need to do. You know, to my mind England is not a dry country at the current time. We've got an awful lot of water in the Northwest, in fact so much that farmers up there suffer. So there are ways and means of shipping water about. But it ain't going to come cheap, and resilience can be built in but we've got to understand the costs that may be involved, and consequently we will have to understand that food prices will rise a bit.

Int: So A, how confident are you in your current licenses, are you feeling comfortable that they're not...

A: I'm pretty comfortable that I'm not going to lose what I've got, but I can't see that I can increase it. Which would be inefficient to be fair, I'd like more flexibility, however you get to that point. I'm not looking to invest in another reservoir at the moment, but I might have to in the future, depending on climate really.

Int: You are not concerned that you haven't been using enough water?

A: Not really, no, we, you know, we've used... we always have a bit spare. I'm a little bit concerned that we've just had two years in organic conversion, so we haven't used very much for obvious reasons, but you try to explain it to them, it goes in one ear and out the other... they don't really want to know. Um but I think we are okay. What will frustrate me going forwards is if... you know I have... Basically on the farm here I have, I'm sorry, I think in million gallons. I have about 7 million gallons summer extraction. Then I have a three million gallon reservoir which is a seepage reservoir. And a ten million gallon winter-fill license in the reservoir. So 20 million gallons in a normal year, will

keep you ticking over. If we get a wet year, and I don't have to take any winter water to fill the reservoir, it would be criminal for them to think they can take it back. And of course, what they don't like is that during the summer, I try and take all the water I can out of the river, rather than out of the reservoir, because I've already paid to pump it up there and it's mine, but they don't obviously, they don't like that very much, but that's tough. It's tough shit really.

B: Well, it is.

A: And I know, I've been there before, where actually the water in the river might be available during April May and June, and then you hit a dry period, a really dry period, and it won't be there in July, August, September. So I can't say I'm going to hang on to it for later, because it won't be there.

B: You've got to take what you can when it's there.

Int: So in the context of sort of you are allocated a specific amount of water, you need to try to use that up to prove to the EA that you are not not using it in case they take it away, can we talk about irrigation efficiency... First of all what do you understand irrigation efficiency to mean?

A: It means application techniques with the machinery we use. It means efficiency in energy, at the pumps. But also, something ■ does, is he works for a company that puts probes and things in the field. So every morning we come in the office I've got all our outlying farms and fields, plus the ones here. They give us a computer read out at six o'clock in the morning, about how much rain we might have had, which is very patchy as you know. You could be 100 yards apart with two rain gauges and find a dramatic difference. But it gives us a really good steal of what we think, well, what we've had in each field. It also tells us what our moisture levels are, and which parts of the soil profile are using moisture and all those things, and it helps us planning to irrigate, how much we are going to put on, so we don't waste water.

Int: So it's about putting exactly the right amount on?

A: So that's pretty important. The application, we've got, I think we've got 7 booms, which just help when it's windy and things like that, better application.

B: More even, more even application.

A: Yep. It's not be all and end all because you get 20 mls of water in quite a hurry, which sometimes can run off and doesn't soak in properly, so actually thrashing it into a potato (unclear) with a gun can be quite efficient sometimes, if that makes sense. We use trickle quite a bit on some of the organic crops, especially when we're... Things like butternut squash or some of the fleeced... potatoes, or the crops that have got plastic on them, to keep it underneath. Organic potatoes, we do quite a lot of. Just so we are not upsetting blight spores with overhead watering. So, yeah, I think we are pretty good at how we apply it. The guys all have training and what have you.

Int: And is it increasing the irrigation efficiency an aim that you pursue?

A: Yes, but I think it's nearly plateaued at the moment. I'm not sure when the next stage is going to come. How we can be better at what we are doing. Yeah, it's not as easy as all that, you get to a point where you think well, I can't do a lot more.

Int: So you feel that you are using the right technique and technology for each crop

A: Well, we are fully aware of how much water costs, so the last thing we would want to do is waste it.

Int: I think you may have already answered this question, through our discussion, but your aim with irrigation efficiency is to produce a higher quality product, not to reduce your overall water use in any respect? Because I guess some people's understanding of irrigation efficiency is that it just means using less water, that's just some people's take on it, but it could be understood in different ways.

B: I think most people would say that if you start to get more efficient with water you start using more water. That has been shown to be the case.

Int: Because?

B: Because people always underestimate how much water crops need and use at certain times.

Int: So people have been in the past to under-irrigate when they didn't have the precision to understand exactly what was required?

A: I think we look upon it from a business point of view. I expect an irrigator to cover fifty acres a week. That's just a ballpark figure. When I didn't have as many irrigators doing it I could stretch it to about 70, but that meant it never stopped. So in the practical world you can't really do that. But that allows us to get around everything once a week. There's certain times from a quality point of view when it does get dry and actually you struggle to do fifty acres and you need to get round in 5 days instead of 7 days. Sometimes you can get a bit that's so dry that you nearly need to irrigate it twice, you need to wet it...

B: Yes, you need to wet it first so that it goes moist...

A: We know all those tricks. We know what an ideal scenario is. It's just trying to manage it with all the crops.

Int: And do you rely more on your own personal perception of looking at the soil and seeing what's like in the field, or do you rely more on the probes?

A: Very much so, we very much do that. We have an agronomist who's here every week walking the field. Any my managers, they get the fork out and have a look as well. ■'s probes are not faultless. They are only as good as where they are put in fact.

B: They are only as good as where they are put and they are only another management tool. They must not, and I would never advise anybody to use them in isolation because, with the best will in the world, that probe goes in the ground in the middle of this desk, and the best that it's going to be doing is actually monitoring nothing as big as this desk. So you've got to know your fields, you've got to know your soil types, and you have got to get a fork and spade out. And the probes will tell you what's happening within their little radius, and if for some reason or other the installation's been poor or for argument's sake I installed them next to a potato that didn't emerge or a carrot that didn't emerge or whatever, I'm reading not quite what the general thing would be. I mean you often go back and move them because things haven't emerged. But the probe is only another management tool, and when it's out twenty or thirty miles away, that gives you an alarm call to say, I need to be looked at or this field needs to be looked at. And if you are asking somebody else to be applying water on a contractual basis if you are renting land and so on, you've got a rain gauge and they say they put 20 ml on and you are saying they only put 10ml, you've got an independent piece of kit to tell them that. And you can tell them not only the rain gauge, but you can show them in the

soil where it hasn't gone or where it did go or whatever. So they are a guide and a management tool, they are not be all and end all.

Int: So in addition to the probes, beyond having human perception on the ground, there are other options available, like using satellite imagery to assess the..

B: Yes, it's available, but people aren't using that yet. It's not reached the general farming people that that is accessible, and also I think people would balk a bit at the cost of having the right sort of. You'd need to have some pretty expensive software and some fairly adept understanding. You've got to understand what you are looking for and that takes quite a lot of training.

Int: And do you think, is there a limit to how far you would be willing to rely on precision technology in order to still feel comfortable?

A: You've still got to go in the field with a fork and have a look.

Int: Would you say that your approach to irrigation has become more reliant on precision technology over time?

A: Well, it does, because of how spread out we are. You can't physically you know, we don't just farm here, we are in a 30 mile radius. So you wake up in the morning and think, I wonder how much rain they have had over there and to get in the car and go and have a look, well there's times when we might have, oh, between thirty and forty irrigators going. And to manage that efficiently without help from some electronics, is a bit difficult. And the other thing that always happens. Certainly with some of the probes, one of the hardest things is after you've had a rain, and everything turns... you know you've had a significant rainfall and then it's about when do you start again, and you can save a lot of money or waste a lot of money there because actually if you don't start early enough before everything's dried out, you can't catch up.

Int: Yes.

A: So, you know, it's just management, but you have to be aware of it and know it. And even if you start four days after you've had a rain and only put 12 mls on instead of 20, at least you are on top of the job. It's a fine line, but it costs so much bloody money, you can't afford to get it wrong, but if you get it wrong, it costs you a fortune!

Int: Do you think that the risks that you are exposed to have changed over time from in the past when you were not relying on these technologies to assist you in determining how much irrigation to employ?

A: Well, we didn't have as big an area to cover, you know, so there was less irrigators, less irrigatable crops, and you could get around and manage it with a fork without... And it didn't.... But actually you would still run a spreadsheet too, so you'd know when you were last in the field, and you'd know in your own mind in a normal week you've got to be back in that crop in 5 or 6 or 7 days. So I'm not... the technology just confirms what you probably already know.

B: And you haven't, I mean in the UK we haven't got the staff to be in crops, like, so for argument's sake, where I was working in Spain, each farm had a regador. So they had a man who was running the irrigation on that farm, and that farm would probably only be 50-60 Hectares, because they were using trickle and not overhead systems and so on and so forth, you needed that chap, and he was spending the day walking up and down... walking up and down, checking for leaks and things like that. If he was anybody at all, and you'd trained him right he also understood what the crops were needing, and understood what was there and whether there was too much salt build up and

whether they needed flush it out, where there was fertiliser requirement. So they had guys on the ground doing that, but they still used probes. And a lot of that was because they hadn't trained them... regards - he was a Moroccan out of the middle of the Sahara possibly, who had come for a job, but had received little practical training and what you could use him as against what he was capable of doing.

Int: Well, I guess it would take many years to build up the kind of knowledge you would need to be good at that job and then the human resources would be hard to find I suppose...?

B: And we don't have vast labour forces on farms now compared to what we used to have. We are running now with a team which was 30% of what you would have run it with 20 years ago?

A: I don't know, I seem to employ more and more people every time I look at the bloody wages run! We've actually had a big change for next season, it's sort of part to do with it. But irrigation is so important, we had some serious issues last year with a guy. It's always been the assistant manager's job to make sure the irrigation happens. It's one thing sitting here and saying right, we need to put 20 mls on this, 15 on that and we need to do that one on Wednesday. That's one thing, but then you need somebody to go out and practically do it. Our guy last year got us in a real muddle. He was totally disorganised. Bright fella, don't get me wrong, but hell, there was always tomorrow. But with irrigation, it's today, not tomorrow. On the back of that we ended up with probably far more scabby spuds than we should have had. So we've totally changed it, we've got one of our Eastern Europeans who used to run 8 guns for us, who's quite a bright lad, as keen as mustard. We've promoted him, and he's now in charge of the irrigation. We've got rid of the assistant manager and we are not having an assistant manager any more. They come here 2 or 3 years and then they buzz off and it doesn't help anybody. So we now have a growing manager under the main manager. And that will make a dramatic difference, because he's really keen to make sure things are done in a timely way, and there will be four or five people moving irrigators first thing in the morning and last thing at night. If it's going to be windy we make sure the booms go in the right place if we've got to do a day run, but they'll all run at night. And all those things help with efficiency and cost. I know he will do that. So, it's quite...

B: It's a hell of a responsibility.

A: So what I'm saying is that some of the guys you employ are really keen to making it work, and they make a huge difference to efficiency, quality everything.

B: Getting the maximum out of your investment in the machinery is pretty critical. And one wrong move by the wrong move by the wrong man at the wrong time, is a problem. And I would say generally, speaking, moving irrigators on some of the farms is a secondary job to the main role that that person may have, and they won't receive much training, although they will have received some. And they won't understand themselves the implications of getting it wrong, or the benefits of getting it right. And that is reflected in, you can see it in, I know which farms because of the work I do with [REDACTED] and so on and so forth, I know which farms have got people who understand what they are doing against those who it's a secondary role to go and move the irrigators every morning, somebody wants the extra overtime, or whatever, who just sticks their hand up and runs in and says "I'll do them this week". It'll be somebody else next week. And because when harvest starts, it'll be that the best guy is on the combine. When actually, that's a crucial time when you should be getting around doing your best irrigating. So there are, you know, certain factors in there, and there is a lot of scope for improving, and making your business more resilient because you've improved the way you apply the water. There's still a lot of scope for that.

A: Yes, we've just brought a thousand metres of underground main in, so we will be at the point in 5 years' time where nearly all our farms will have a hydrant every 72 metres, so you don't have to use aluminium pipes across that. That might sound a silly thing, but if you've got a lot of guns to move, it's so efficient, and it just helps the guys who are doing it. You know a lot of the pumps now and mains are capable of holding pressure so all you do is just plug it in and turn the valve on. You haven't got to go back to the pump every time. It's just little things like that. You know, I know because I've got the experience, I can turn the gun round in 20 minutes. A lot of people it would take an hour, especially if they are moving aluminiums as well.

B: Yep, yep.

A: And then you get leaks and that and you move the irrigator up and you go through a patch where a mains been leaking and you get stuck so it's just...

B: Nightmare. So there's a lot of things like that and also, electronic controls now I mean we've got one farmer that switches pumps on and off with his mobile phones. You can switch, if you've paid the money, you can switch irrigators on and off with your mobile phone. So far argument's sake we are sitting here, you've got three irrigators running on farm, and we get an inch of rain. Well you can actually from your office stop those irrigators mid-run and at least just give it a couple of three hours for that to get off the top before you restart them and get them in. You may then be able to just you know...

A: We've got... some of ours are like that, and you can if you want, you know, if you are efficient about what you do. If it's raining and you've still got runs to finish well just go and speed them up flat out, and you might as well get them in.

B: And there will come a time with the research that's going on with water use and such, where you'll be able to remote sense how much water is wanted I'm sure, and you will actually be able to link that to your boom irrigators or whatever it is so that they'll speed up, slow down, speed up... according to the soil type that they are passing over, or the crop that they are passing over.

Int: So you think that the reliance on actual people working on the farm to do the irrigation will actually probably decrease over time?

B: You won't... You'll never, well never is too strong a word. You will always have to move them from field to field, and you will probably also have to move them from hydrant to hydrant on the side of the field. But once they are up and running, I think that you will be able to give far more automated control to what's going on and the application rates that are being used.

A: If we go back 25 years there was lots of people putting centre pivots and things like that in, and it's all stumbled and stopped really, and that's partly to do with field size, but it's also to do with the new technology on some of the guns and booms now, which give you more flexibility.

B: I mean those people that have got centre pivots still use other forms of irrigation in those fields.

Int: Right.

A: Do they?

B: Yeah.

Int: So a centre pivot is fixed?

B: It's permanently fixed and you've just got a massive boom that goes round. And I think from memory you needed to be 30 Ha before it came a real viable option.

A: Yes, it was about 75 acres wasn't it?

B: Yeah.

A: But they are very clever you know, they can go around a square field and they will push extra boom length out when they get to the corners and that, and they are very very clever.

Int: So are they maybe more appropriate for an area where you are not getting so much rainfall? Because I suppose you are making a massive outlay to invest in that system which is not flexible to move to other fields and you may not require it every year...?

B: It is almost totally automated, you can start it up and stop it and do everything remotely.

A: You go out to South Africa or Egypt or any of these places and they all use them as you know, and but it's slightly different, you are virtually taking a bit of desert, or a bit of very arid land, and you've made it very useful. And um, yeah.

B: You've designed the whole farm around centre pivots and it's a different thing all together. But in today's world I would think that centre pivots would do your crop spraying and everything else for you, if you'd set it up to do it, you'd do your crop spraying as well as you irrigation through the same piece of kit. And you've got glasshouses and so on and so forth... protected environments where that's what happens. You've got spray booms that irrigate and do all the work.

Int: So you said the farm has grown over the years in size and that's meant that you need to employ more precise approaches to managing the irrigation of the farm. Do you see... is that generally true of all farms in the area. Are farms just generally getting bigger and...?

A: That's very much the case. I'd say when I started to grow spuds there were something like 45000 potato growers and now there's only about 1800, and we all know each other. And that sounds crazy, but that's what's happened. And people don't see it, but it's happened in all farming, you know there used to be lots of little... you know, a 200 acre farm used to be a viable unit, um it certainly isn't now. But there's still lots of land owners and landlords who own 200 acres but they are farmed by somebody who farms 5000. But they are deemed as farmers because they have to be, but actually they contract farm it out and somebody else does everything on the farm.

Int: And is this because you the smaller farms cannot compete by producing a vegetable that's cheap enough?

B: I mean, I had a 300 acre farm two miles from here, and in 2000 I got out of it purely because long term there was no longer a future in farming 300 acres of sand land in [REDACTED], on its own. And I was already farming, and what was I growing... I was already growing 350 or 400 acres of iceberg lettuce on other farms as well as what I was doing, and I was turning 1.5-2 million out of that, but long term, there wasn't a future in it. And I was surrounded by other larger operations and I wasn't able to flex and get out, and because of where I was, I was only going to be able to come inland because the sea was the next stop, so I was restricted geographically anyway, so my options were pretty limited, so my options were pretty limited, and 300 acres was a non-runner, so I was out. Gone.

Int: And how do you feel about that change that you've seen during your lifetimes in terms of how farming is done?

A: I can tell you for nothing until probably about now.... I've worked a hell of a lot harder than my father ever did. No disrespect to him, but that was the way that it was. And he err, he made a good living off 250 acres, and he educated all us children and all those things.

B: Yep.

A: He did that on 40 acres of spuds and other vegetables. I grow 1000 acres of spuds and I don't think I'm any better off, and that's the honest truth.

Int: You work harder.

A: It's just crazy. You work like hell just to stand still.

B: And the other thing is that there is a lot more, not bad things, but there is a lot more to think about. You've got a lot more red tape. You've got a hell of a lot more responsibility to ensure that your staff are in a safe working environment, in its widest context. And all of those responsibilities that have been brought in... I don't object to them, but by god they put some pressure on. And we are not seeing the rewards for that. I mean one of the things that I do not regret getting out of farming is that I do not employ anybody any more. Because those responsibilities were, I mean, okay 300 acres, I got 55-60 Eastern European students in those days who I was accommodating on site, who would turn up on my front door at 4am in the morning with blood streaming down their face because somebody had walked into a door. You know, things like that you just think, I am glad I haven't got any of that any more. But you know that has all added to the pressure and it adds to the cost, and people don't recognise the costs of making sure that everything is safe and right.

A: The margins are so tight. On everything, you know if we went back to our parents days, you could make a fortune out of... you know, if you've got a crop at the right time, um you could make a fortune, and I mean a real fortune!

B: You could bank it.

Int: Because of the way the market was... I mean people were less growing for contracts in those days.

B: Yes, and if you took those margins, they were just extraordinary.

A: If you had a bad spell of weather and you took cabbages or leaks or carrots... A classic example, somebody up the road, weren't it [REDACTED]? Wasn't it nineties?

B: It was late eighties or early nineties...

A: I would suggest that was one of the last times, but he, he had forty acres of carrots and he was one of the first people to cover carrots up with straw and plastic and they had a really, there was two weeks where he was the only one in the country to have carrots and he paid for that 800 acre farm he'd just bought out of that one field of carrots. Now that is just mind-boggling. And you can't... I can't think of anything in farming where you could that now. The only thing you could do is cover it in houses now!

B: But you get those odd ball days. I mean I had similar circumstances. I had 18 acres of iceberg lettuce one year that were all due for supermarkets, but the market got very tight for one reason or another, because the time of year that I was growing was the end of the season for the English and the beginning for the Spanish, and the Spanish hadn't started and the English had all gone except for us. We had 18 acres of lettuce. We harvest 100% of that crop and the whole lot went for processing. It was originally contracted at 50 pence a kilo. They paid me £1.50 a kilo for that, I mean it was just extraordinary. And you don't see that any more. You'd never do that anymore.

A: No.

B: It was scary, the money that came off that one field, it was phenomenal. And like ■ was saying, I educated my children, all through private education, off 300 acres. No way will my sons do that, and one of them runs 5000 acres now, and the other one works on a farm that does the same. But they will never have the income that I had.

Int: Because it's gone to contracts?

B: Because it's just... they are now working for contractors, they work as managers and so on so forth that will report back and do, but they won't have the income that we had.

Int: So I suppose there's less opportunity to profit now from a good year than there was in the past. But if you do have a good year, do you try to put that money back into the agricultural side of the business, or do you try to diversify, like you were saying, building houses is the most profitable thing you could do

B: Ha, no we usually have to sell an asset to do that, that's the trouble (laughing). Most of us are not keen on selling assets!

Int: But is it kind of investing in more irrigation or do you...

A: I'm lucky, I'm the only shareholder in the company and virtually everything gets reinvested. I mean where we are sitting now, I put this up two years ago which was a huge investment, all this line of buildings, and the concrete and all the bits that go with it. But they put you on the map a bit, and it helps us with our contracts. If Tesco's or Marks and Spencer's come here they see it's a professional outfit and all those things that go with it, and it helps with contracts, but actually it helps with the business and the staff facilities and workshops and... All those things, they all help. But it's a huge investment and there would be lots of people who wouldn't even consider it.

Int: Yes, but it makes you more competitive, you are able to retain contracts...

B: If you can take your customer base out to the field and you can show them professional bits of kit, modern machinery and everything else. I mean you get a chap out of London who comes and sees that blooming great old potato harvester there... they've just, they've got no idea and they see something like that and they think "wow"! And it's ridiculous, but it all has an effect, and you know, wherever you go, farms that are doing well are farms that are reinvesting. They are not farms that are taking the money and running, or taking the money and just letting it tick over and taking the money and letting it tick over, the farms that are doing well are the ones that are using the money that they are making and reinvesting it in new technology and so on and so forth.

Int: And do you think those farms are continuing to expand?

A: You have to, you can't stand still in any business, certainly farming business. If you sit still too long you get (inaudible).

B: There's still a niche for highly specialised small units. And you know some of the fruit growers are just that, they are highly specialised, neat units probably family run with assistance at harvest time, but are dedicated to intensive management, highly skilled and knowledgeable in their own field. They'll probably be part of a marketing group, because that's the only way they can get their product out to the supermarkets, but also alongside that they might well have a local farm shop or a specialist outlet as well that they'll use, but those are the units... you know if you are highly specialised you can be a highly specialised cheese maker, or goat's cheese producer or whatever, there will still be a place for those and long may it continue because if we lose those sort of people as well we really are in a muddle. Because we will go to industrial scale farming then and I think that will be risky.

A: Trouble is this part of the world...

B: It doesn't lend itself to those sort of things...

A: No it doesn't because of the field size. If you go to Lincolnshire and big fields, big flat fields, it's a bit different.

B: But climatically, you've got one or two intensive people around here. Because you've got the sunlight advantages.

A: That's right, some of the fruit guys and the livestock people, you know they've all done exactly the same as we have and we've all had to do that. You know, the only fruit growers worth knowing are the ones who specialise and they become very close to the customer and the reinvest and all the other things. Same as dairy herd. Anyone tells you a thousand cow dairy herd is obscene doesn't know what they are talking about.

B: Doesn't know the economics.

A: And if I was a cow I'd rather be in a thousand cow unit, because you will get absolutely the best of everything, and you'll have a vet on site and everything will be recorded meticulously and if you are not well or at the first sign of mastitis, you'll be sorted, and they use all the technology available and all of those things, and they'll be the ones who survive.

Int: Yeah.

B: We are not really talking about your resilience title but you know!

Int: Yes, I was just going to move it back to, because we've been talking for a long time and you are probably both getting hungry and have other things to do, but I just wanted to ask you quickly about the system more broadly, the vegetable system in the UK. Who do you see as being the important stakeholders in the system that may have some impact on farm water use?

B: Well the supermarkets are bound to continue to influence water use purely because of what they are trying to get in terms of quality. But also, the need to create a yield as well as quality, to get the returns that are currently being paid, or to make a profitable return out of the prices being paid for produce at the moment. I mean there's no point in growing ten tonnes an acres for fantastic quality carrots, because the prices being paid for them won't justify it, so you've got to get your quality and your quantity, so the market place, and that is really the supermarkets, will continue to have a huge impact on how water is used and how much investment there is to put back into making water use

as efficient. Once you get beyond that then the environment and all sorts of other things, the environmental lobby will have an impact. The Environment Agency has to monitor and who is responsible currently for licensing our volumes of water that we can take, will be driven by all of the other pressures. So they've got the environmental lobby coming in, they've got the farm lobby coming in, they've got public water supply... all feeding into what they will allow us to take.

Int: So between the retailers and the regulators, which do you think has the bigger impact in terms of determining...?

B: The regulators have the bigger impact in terms of their ability to be a complete an utter nightmare, but we are wanting to run profitable businesses and the way we make a business profit is by getting the right price for the product, so really the supermarkets.

Int: And do you think the consumers think about water use at all in the food that they consume?

A: I err... I'm not sure that a lot of the general public put two and two together. You know I don't think when anybody thinks about food and why haven't I got the Brussels sprouts for Christmas then um I'm not sure they ever consider water being an issue. And actually as we know there's a very small proportion of the water used in the country that goes on irrigation. So for the public I don't think it's a big deal...

Int: Do you think it should be?

A: I think they need to understand, yeah. Because, the thing that, if you come back to the regulators again, we are having to compete with people in other parts of the world, who have no regulation. Can have as much water as they want, or take as much water as they want, without any regulation. You know I've been to, we went to Egypt didn't we... [REDACTED]?)?

B: No

A: Oh, we nearly had a fit out there, you know, they are going into raw desert and growing potatoes. The sand is full of salt, so they put down the bore hole, with a 70 acre centre pivot, and they water it like made for quite a period of time to wash the salt through. Then they grow a crop of sweetcorn or maize, which is quite tolerant and it probably gets 10-12 inches of water through the season, which helps wash it through. Then they grow 2 or 3 crops of spuds on the trot, until the water supply gives up. You know the water supply was being recharged at half a percent a year, so as soon as they sucked that dry, it was going to be years and years and years before it built up. But they are allowed to do it, and those spuds are on our shelves now and that does my head in. That's so wrong.

B: The public in general have no appreciation of the water problems that we export by our wish to have certain things on the shelves at certain times of year. They got no understanding of that, none whatsoever, and they don't appreciate that you know, even if we produce them here, we can't produce them without water. And one of the things that I've done under the [REDACTED] hat over the years is go and talk to a couple of events that the [REDACTED] have organised and you get a school kid asking, what's the most essential thing for the food that's on your plate today, and they just don't get it. We won't grow anything without water chaps. We can grow it without soil! But we still need water. We can grow it without air, but we can't get away without water. And it's very interesting to get the reaction of children, there's some that suddenly, you get the lightbulb moment, and those are the ones that I could spend hours talking to.

Int: So it sounds like you feel that in some respects the UK's fruit and vegetable system as a whole bringing not only... consuming domestic produce that but also bringing produce in from overseas, is not as resilient as it could be because we are having impacts overseas that are quite negative in some cases. Is there any way that you think the resilience of the supply chain as a whole could be increased? Is it to do with changing people's perceptions or building awareness? Or putting restrictions on where we get food from in certain circumstances or... what do you think the solution is?

A: I think ultimately if you went back and we all ate seasonal things, the environment would be better off, we'd all be better off. But I can't ever see that happening. How can you tell somebody that he can't have a, I don't know a lettuce for 6 months of the year, or it wouldn't be 6 months, but it would be a period of time where you couldn't do it over here unless it came out of the greenhouse.

B: We are getting to the stage where we could provide nearly everything year round in the UK, but we wouldn't be able to provide it at the volumes that are required to meet the market place. So seasonality, a return to seasonal cropping would be lovely, and seasonal diet, would be lovely, and a reduction in the amount of imported product, taking the stress off the water supply in whatever region of Spain, or strawberries in California where the aquifers are so bloody jiggered up that they are now down 800 metres to get fresh water or whatever it is, would be beneficial to the whole place, but we've got an island to produce food for, with a growing population that doesn't appear to want to stop growing, with a reducing acreage of viable land, and we are going to have to find something that'll make it stick, but what quite that'll do I don't know. But if we could get out of the habit that we've gotten into of strawberries at Christmas and iceberg lettuce year round for your MacDonald's and the like, it could be a big step forwards. But politically that wouldn't wash. That won't wash.

Int: And, this is my last question. You've increased irrigation efficiency over time. Do you feel that your business is now more resilient to water-related risks than it used to be in the past?

A: It is far more resilient than it was, yes, we are far better at doing it. But ultimately, as farmers we are totally controlled by him up there and the weather he chucks at us and we have no control over it. You know, sometimes you think that supermarket buyers think you are in total control of it and everything's under a roof, it's just unbelievable, they don't get it sometimes. So um, yeah, no we are definitely better at what we are doing. And what most of us are doing is pretty sustainable as well. That's pretty important. But I do have this um... I have had some interesting conversations and comments and err with some people, but I do have this perception that Government thinks that farmers are a pain in the arse and they'd be far better off if they imported everything.

B: Yeah

A: Because there'd be no pressure on the environment, whether that be water, or countryside. They could manage us like a glorified fun fair, if you like, or park. There'd be no water to clean up from insecticides, phosphates, slug pellets, all those things, and there'd be less waste. And it would be just so efficient to import what we wanted. And that's an awful scenario but actually there's a little bit of sense in what we are saying. You know they wouldn't have to pay farmers subsidies and all that, which is bonkers, but...

Int: I can't imagine England being England without agriculture...

A: No, no. But you can see where I'm coming from.

Int: But you'd have to very confident that the political stability of the world was such...

A: Course you won't, course you won't. Because once you plant the place with trees and what have you, it's very hard to get the infrastructure back. But the other thing is there's a lot of British farmers who actually think they are pretty good at what they are doing, and to be fair, they ARE good at what they are doing. But they are not the best agricultural country in the world. You know, you look at... Brazil is a classic example. We went out there 4 or 5 years ago and were absolutely stunned how efficient they are, and how technically advanced they are. Whether it being cattle-breeding or crop-growing. They are amazing. And the irrigation they've got as much water as they like. Just phenomenal, and it made us look a bit silly really.

B: Well, it did. Yeah but, they haven't got the regulation.

A: They can grow two crops a year you see.

B: They haven't got the regulations in place that we've got.

A: They've got far more than I imagined. You know you can't go chop a tree down in a field or let your cattle within 50 metres of any waterway or anything like that which is, if you've got a rover the bloke's got half his cattle in the bloody river and you think it shouldn't be allowed really. But the Brazilians have got it right. They've really invested in technology and they see themselves as a net exporter of lots of different things around the world and they are damned good at it.

B: They've got a lot of wide open spaces, they really have!

Int: They've got a lot land I guess. Well I think we've covered everything that I wanted to ask. Thank you so much that was really really interesting.