

K: The water arrangements change a little bit, but I generally aim to have somewhere, because we have an underground mains reservoir system I generally try to feed it through overground piping from the borders of our farm, so it tends to be neighbouring farms that we grow crops on.

Int: So what water sources are you using? Surface or groundwater?

K: So we have a winter storage reservoir which is I'm going to forget how many cubed metres it is but it is around 48 million gallons. We have a further 5 million gallons from a winter stored ex-gravel pit. The 48 million gallon reservoir was built by my father in 1977, so that is winter filled from one of the tributories, the brooke. And the same with the 5 million ex gravel pit, that is also filled during the winter.

Int: Okay, so there's no groundwater it's all...?

K: It's all winter storage.

Int: And do you have a summer abstraction license as well?

K: We do have a summer abstraction license as well but it's fairly marginal, it's about 3 million gallons.

Int: Okay so you are predominantly quite reliant on winter water and you use that up throughout the course of the season.

K: Throughout the course of the spring and summer.

Int: And if you have really poor spring and summer rainfall is there enough to get you through?

K: There should be enough yes.

Int: And what if you suffered two bad years in a row?

K: We have yet to run out. We've come close, but we didn't fill it up over the winter. And generally we have quite a... The brooke is quite a resilient flow. It is very much reliant on feeding

further upstream, and quite a lot of it is now so it does respond very rapidly to rainfall because there's so much concreted area further upstream. So you do see a very rapid response.

Int: And so your licenses are they time limited?

K: No, they are licenses of right.

Int: And are you confident that they are going to remain so?

K: No, never confident with anything that is out of our hands. But I believe that we are in as good a position as any given that we are winter storage and we are taking the demand when least required.

Int: So is the Environment Agency doing anything... I mean I guess I understand more about the time limited licenses because I know they come up for review and they might be, the overall amount of the license might be reduced. Is it the same for...?

K: No I do believe they are undergoing, I mean you guys could probably tell me better, but I do believe the EA are currently undergoing a review of the whole set up, the whole water strategy. But I would like to think that as I say our position is as strong as any. I do maintain the summer license as well. I do make sure my returns say that I'm using it. Because I believe it's a situation that if you don't use it you lose it.

Int: So does that encourage you to be more efficient with your water use or...?

K: I think efficiency with water is very much more based around what the cost of water actually is and that's energy requirements rather than water itself.

Int: So in order to make sure you use up your summer license do you just prioritise using that first and then move on to the reservoir?

K: I tend to just balance it on the returns. [laughs]. To make sure that I've used up a fair proportion of it, even if I haven't, if that makes sense.

Int: So you are mainly growing onions and doing a rotation, but did you say you also grow potatoes?

K: We grow potatoes as well, so we grow around about 60 Ha of onions and 20 Ha of potatoes, and we do occasionally irrigate cereals if we've got the capacity. And it's a very dry spring.

Int: And would you say that the proportion of your income from irrigated cropping is constant over time or is it increasing...?

K: Very much so, probably increasing, erm we specialise in red onions and we are now going further beyond that, my father is a plant breeder and he's bred a new onion and that is very much the focus of the farm's attention now. But the water requirements are very similar.

Int: And what's the destination for what you produce on the farm?

K: Er retailers, multiple retailers. So the conventional onions generally go to the big four, we currently supply Sainsbury's, not so much Tesco's, we are doing a little bit into Morrisons and also ASDA through.

Int: And are you 100% contracted or ...?

K: Generally yes. It's all done through our grower packer, Growers. Who manage a number of grower supplies into the various retailers.

Int: And nothing is sold for processing? It's all.

K: Things are sold for processing but it's not the main focus of the farm. If the quality is poorer we try and maximise the return so rather than throwing something away you try and get it into processing if you can.

Int: So thinking about the business, which water-related risks are of most concern? Obviously there's water scarcity which we've talked about a little bit, but there might be some others that you are concerned about?

K: Nothing comes to mind. I think given the current change in climatics we do seem to go through extremes, whether that be intense rainfall periods or intense drought periods, and they seem to be becoming more exacerbated. I don't believe that there is anything currently that we can't handle. But you did raise it earlier that yes you could get a 2 or a 3 year drought situation and that would probably be my biggest concern. But I would like to think that we could handle it as best we can. But how far do you go?

Int: Do you think you'll be looking to build any more reservoirs in future?

K: No plans to at the minute. My father and my uncle built the reservoir back in 1977. It is on a tenanted holding, you are putting a very valuable asset onto someone else's land. I'm not keen to continually do that so.... But I believe that the reservoir we have is sufficient for our current requirements.

Int: So have you had any problems with water scarcity in the past, I mean you said you hadn't actually run out of water in the past

K: No we are very well placed in that respect.

Int: And things like biological or chemical pollution in the water?

K: No, we do have regular monitoring of the reservoir but given it is a winter source, so you are pumping in during a high flow river period, and it's winter-stored, I don't think it's a major issue. But our requirements are from various...

[Father enters and introduces himself]

K: So our audit requirements are that we have to have the water tested annually. In fact for M&S field to fork I think it has to be every month, so, and no, no issues to date.

Int: So what do you understand by the term irrigation efficiency?

K: Irrigation efficiency is essentially targetting the water to where it is needed, which is obviously to enhance crop growth. So it's meeting those requirements without excessive waste.

Int: And what approach do you use at the moment, both in terms of scheduling and application?

K: So we use neutron probe monitoring for monitoring crop usage and we are using a combination of rain guns and booms to deliver the application. We haven't gone down the road of drip, trickle feed. Simply from a logistics point of view, it's just not practical on our scale. But very much in the last ten

years we've switched towards booms away from rain guns which gives you a far better distribution, a uniform distribution, but also the ability to apply during strong winds as well.

Int: And I guess you are perhaps in a slightly different situation from some other growers who permanently own their land because they may make investments in centre pivot...

K: They may do. I think centre pivots are fine for very large scale, prairie style farms. Centre pivots aren't very practical for very awkward shaped fields.

Int: It seems to be the case in the UK that there's a limitation on them, because soil types vary as does rainfall.

K: I mean we've got a contact out in South Africa who we supply with onions and he's just got centre pivot after centre pivot and he's in the middle of nowhere, and he's able to use laser levelling, centre pivots, taking out the Vahl river.

Int: I suppose he also knows he definitely is going to use the centre pivot every year, where as you can rely on some rainfall.

K: Interestingly, we, despite variabilities, we do end up irrigating a very similar volume year on year. We generally apply between 20 and 25 mm to a crop at any one time, and if you look at the records going back over the last 5-10 years, we have generally applied between 5 and 7 applications throughout the season. Sometimes that can be early season or mid-season, or even, last year I think was a classic, (or was it the year before, I forget now), where we applied everything in late July and August, so it was the year before, it was 2016.

Int: I guess for onion production you'd want slightly drier conditions towards the end of the season?

K: That would be the ideal, yeah. Very wet conditions, and this is why we ended up in '16, applying so much later on, was because it had so much water in the early stages, the roots didn't go down. They didn't form a decent structure of root, um and as a result very poor rooting, the end of July and August came very dry and you were having to irrigate every four or five days, because there was just no rooting ability there.

Int: So do you do anything other than the probes? A scheduling service?

K: No. The probes are run by a local scheduling company, and he also walks it weekly and we have a meeting every Monday to discuss the requirements. Sometimes you, for instance I just mooted 2016... the neutron probe readings were telling me one thing but knowledge and understanding of the crop itself, going out with a fork, tells you another thing. So sometimes you have to override.

Int: So why were the probes not telling you the right thing?

K: Because the root structure just wasn't...

Int: So looking actually at what hte plants had been doing.

K: Yes, looking at what the plant's been doing. We knew that it was only really drawing water from the top 20 cm, whereas normally it's drawing from 50-80 cm down.

Int: So you've indicated that you've changed from guns to booms recently. Do you think that has increased the irrigation efficiency of your business?

K: Um, it depends on what you mean by irrigation efficiency. It certainly has increased the efficiency of application, and I do believe there's a benefit when you look at two crops like for like, one irrigated with boom and one irrigated with a hose reel. But I would say that it does require more labour requirement. So if you are looking at it in terms of labour efficiency, then no.

Int: Because?

K: Because it is a one man operation to move a rain gun, whereas a boom can be 2 or 3 people.

Int: How do you find out about new approaches to irrigatin or scheduling?

K: Well, we are members of the UKIA, we get their reports very regularly. Reading the farming media, and also liaising with other growers to discuss the latest techniques.

Int: And comparing the situation within your production in terms of how resilient you feel to water-related risks, with that of other growers in similar situation to you, other onion growers, perhaps in the area. Do you feel that you are able to be more resilient than other growers?

K: I would say, potentially, yes. I have a very hands on approach to irrigation. I'm probably far more passionate than many others, and I think individual input in management helps a lot in that respect.

Int: And what do you think would be the next step in terms of developing your irrigation approach? Either changes to scheduling or application...

K: I would think the main essence of my approach at the minute is to modernise quite old equipment, and so move away more from rain guns to booms, um, we have just also modernised our very old reservoir pump system, that was done last summer, to create a more efficient structure, energy efficient and automation, which should make things considerably... so it is an ongoing modernisation programme. But I don't believe that there's any major technological breakthrough that will change our system currently.

Int: And things like satellite imagery, or drones...?

K: I do believe that there is a place for that, but it's yet to be proved to me that there is a major benefit to it. I think a lot of it is in the early stages and a lot of it is very distracting.

Int: Yes, and I suppose you can make a big investment in somthing...

K: A big investment in something that could easily... for instance you could have a drone going over a field that you've just irrigated. What it will probably show you is where the wind has picked up and blown it and distorted it. Which you already know.

Int: And then is there anything you can do?

K: Yes, you could try and use a boom where you can, or you could say well you'd try and irrigate, but when the pressure's on... you try and irrigate when the winds are low but it doesn't always work like that. So it's a little bit like um yield mapping. It can be one of many different factors that's causing that yield to be reduced. Probably, mainly irrigation when you look at the variability across a field or soil type, but yeah I think we are a little way off regular drone technology.

Int: And what about something like waste water re-use? I guess you'd be quite well-positioned here potentially because you are near a large city.

K: As I say I don't believe that we have that necessity for wastewater yet, because we are winterstored. It would be quite costly as well. There is a big thing especially with some of the retailers, especially M&S, they are very, very focussed on water quality of irrigation, and the cost of putting infrastructure in to use wastewater and monitoring, etc, when the retailers are only paying at best costs of production, I just don't believe it stacks up at the minute. Maybe if things change with the way pricing is with the retailers, but there's no sign of that at the minute.

Int: So you mentioned... I can't remember which accreditation scheme?

K: Field to fork. Marks and Spencer's field to fork.

Int: So are you finding that retailers are able to influence your water use on farm quite a lot through things like accreditation schemes?

K: The only area in which they've really focussed in on is probably the quality. They do ask us to conduct these water management tools and efficiencies, etc. I find it a bit of a side issue. At the end of the day the key to you as a grower is to maximise your yield, your quality, as okay, you are going to say, yes, well, I could save myself a bit of water there, but the priority is to get that water on at the right time.

Int: So they are not putting a vast amount of pressure on you to be more efficient with water?

K: No. no.

Int: And have you ever experienced problems with contracts that have been agreed where you haven't been able to... where the contract hasn't been fulfilled by the retailer on the basis of quality?

K: No. I have, probably 7 or 8 years ago, had issues with poor yield. Obviously with onions, size is very much associated with yield. I was responding to the previous years weather conditions, and I mistakenly held back from irrigating late in the season because I was concerned I wouldn't get harvested and as a result I had very poor yields, and poor sizing. And that was my mistake, but it does have quite a major impact on cash flow and your financial position. I wouldn't say that there was any reason within my business for it to be out of my hands, unless it's excessive rainfall. Because I have the ability to jump when required with irrigation.

Int: So in that case, you paid for that mistake and....

K: I paid for that mistake, but I don't... short of a major 5 year drought or something like that I don't believe that there is a situation where I can't rectify a dry period.

Int: So looking at the other side of it, if it was a case where you had really severe excessive rainfall and it's something that's beyond your control and you can't really do very much about. Is that risk carried by the retailer to any degree or do you still absorb all of the costs?

K: We absorb all of the costs and all of the risk.

Int: And do you think that's fair?

K: No. The way the retailers are now set up is that they are all fighting each other, they are all concerned about the impact of the discounters on the thing, they are looking at their own margins and looking to see where they can tighten things up, and the easiest way to do that is to beat the supplier. So within the onion world the suppliers are the packers. The packers, there are too many of them, and when you have a situation of too much supply and not enough demand, it's a bit of a blood bath when it comes to pricing, and that's what we are currently experiencing. And pricing will be lower this year than it was last year, which was lower than it was the year before. And it's a continuous downward pressure. And it's a very depressed market situation.

Int: And do you see the impacts of that on any growers, I mean are people going out of business?

K: People are very much assessing their situations individually. I do know of some people that are cutting out growing. But then there's the argument, if you don't grow that, what do you grow? There's also the argument of, if you go out, will you ever go back to it. Because of the cost of the infrastructure required. Once you stop you are very unlikely to go again. So that plays, that generally means that farmers go on longer than they should do.

Int: And in terms of the relationships that you need to have with packers and retailers, is it easy to make those relationships afresh?

K: Er, no. At the end of the day, most packers have their existing growers, and yes if they get a new contract then they'll sort of cast out beyond their standard grower base, but it is very much a closed circuit of growers generally for each one. But we are fairly well placed in that, we got chopped out by Sainsbury's ten years ago, as a packer that is, growers. But we continued to supply Sainsbury's via another packer and since then we have made it our aim to supply as many different outlets as possible to reduce the risk of any individual supermarket.

Int: And what precipitated that with Sainsbury's, if you don't mind my asking?

K: Sainsbury's looking to squeeze the grower through the packer. Lower pricing.

Int: So you eventually said, enough?

K: Well, you get undercut by another packer. Sorry I should probably give you a bit of background, Growers is also a supplier-packe to the retailers, so I have a fair bit of linkage indirectly with the supermarkets where that goes on. So yes, I see both sides of it, I see the packers side and the growers side.

Int: And thinking about your competitors, is it mainly the case that retailers are playing you off against other UK growers, or is it...

K: They are playing packers off to packers, at the minute it's very much focussed on UK grown product, but there is always, in the background, imported Dutch material, essentially, which has a negative effect on the pricing in the UK.

Int: And thinking about potatoes for a minute, I mean UK is pretty much self-sufficent in potatoes, but there are overseas producers particularly in places like Egypt that have potentially much higher water scarcity footprint associated with the production, essentially more negative environmental and social impacts. Do you think that retailers care about that? And do you think that consumers at the end of the supply chain are particularly interested?

K: Retailers are what's their most important thing, it's survival. And that is the biggest concern that they've got at the minute. The only way they can survive is to fight the discounters, that, so as long as they can get their product as cheap as possible, that is the key thing for them. You get slight differences at the high end of the retail sector, I'd say. Probably Waitrose, and maybe M&S are a little bit more sensible about things, but the big four are very much running scared.

Int: So price is the bottom line. And for consumers, do you think they are aware of agricultural use in terms of the fruit and veg they consume?

K: No. No, I think most consumers have got enough worries to be thinking about without worrying about where their... As far as they are concerned as long as their fruit and veg is on the shelf when they go to get it, that's their main concern.

Int: And do you think they should care of should somebody else in the system be responsible for overseeing these issues?

K: Er, I think that they probably ought to care, but I think water scarcity and such other issues are very much linked in with the general negative situation we've got within the retail sector at the minute in that there is no money for investment, because everything is down to cost of production. Their is no room for investing in the long term. Which I think is a very major error by the UK, probably by the government.

Int: So at the end of the day it should be the government who are overseeing things?

K: It's all very short termism. Er, everything is short termism, whether it be retail, whether it be the government, or whether it be the consumer.

Int: Yes, and I suppose, governments... election cycles are short.

K: Governments come and go. They are not worried whether there's going to be a major food issue in thirty years time, twenty years time.

Int: So what do you see as the potential solutions to create a slightly longer term perspective on agricultural water use.

K: I think you do need investment in research and development and grant aid infrastructure, which is going on to a certain degree, but I think it could be more carefully managed by the lawmakers.

Int: And what do you suspect may happen with Brexit in terms of the environmental implications?

K: I think the environmental situation will be far more important than food production. We have now gone for six decades of excessive food production, there's never been an issue of getting food on the shelf, and I think it is completely off the radar of the politicians to be concerned about it. They just take it that, "well, imports can always make up". But what you've got to remember is that at the end of the day, if there is a global food shortage, each individual country will concentrate on feeding themselves. Which is what the Chinese are doing. They are buying up parts of the world, they are buying up parts of Africa and South America to be able to cover their needs and demands. We aren't in that situation. I think it is very very concerning from a UK point of view that we are so obsessed with imports.

Int: So thinking about the fruit and veg supply system, rather than just purely the on farm questions about water use. What do you think could make it more resilient? It sounds like you would promote more food production in the UK?

K: Yeah, I think investment, I think there is an obsession with keeping food pricing to a low, and that is in the politicians' interests at the end of the day. They need to keep the house spending as low as possible. I don't think that is very good long term. It's a very short-term view and I think it's a big mistake. I don't know quite what the answer is.

Int: Well, I don't think anyone does really. I think we have covered anything. Is there anything that you want to ask me or any comments that you want to make?

K: I was just going to say, I don't know quite how Brexit will play out. It is a, I think the future is very very uncertain, and I'd say the future is very uncertain whether brexit was to happen or not. Personally I, sorry, going on a little bit here, personally I believe that the EU itself has got limitations on time. So whilst I voted remain I'd probably vote out now, mainly because I just believe that the EU is a very negative backward looking institution, and you look at where the world is, where the driving economies of the world are, they are in Asia-Pacific, they are not focused in on internal issues, like you have in the EU.

Int: I guess it's the case that the larger and more complicated governing structures become, the more time consuming it is to get anything done.

K: Unwieldy, yes. And you are looking for the agreements of 27 or 28 member states all with very very different issues. And you've even got that now with Eastern Europe, and they have got a very different opinion on how Europe should be run than maybe the franco german pact are. And I think it's going to be very very divisive in the long term. Personally I think we are probably better off getting out now than when it starts to fragment in 10 or 15 years time. Which is an argument I very rarely hear said.

Int: I guess the UK's always going to be on the edge of Europe, just geographically speaking, and perhaps it does make sense to get out now. I mean you can look at it from so many different angles can't you.

K: One of the major undercurrents is the euro, and that's unsustainable in it's current form. Some of the Mediterranean countries really never should have joined the Euro and really that's just a ticking time bomb and that might well be one of the things that kicks in the break up of the EU, I don't know. I don't want to see the EU break up because at the end of the day, the UK is very reliant on Europe as a market place. I think what should happen in some respects is there almost should be fragmented up the EU and you've got some very different economies. Some would say the EU

should never have expanded beyond the 1975 expansion, should never have included some of the Mediterranean economies which clearly weren't up to speed like the rest of them, even Spain... they've benefited greatly from the EU, but they are very different economies to Germany and the Benelux countries. But we'll see! But yeah, with regards to water scarcity I do believe that probably far more threatening to water scarcty than Brexit or Government investment is a changing climate. And yes a lot of people are very disbelieving of climate change. I think it's quite evident that we are going through extreme weather conditions. Whether it be here, we grow some onions down in New Zealand, and they undergo very similar, erratic... It's the erratic nature of weather conditions that make things... but in some respects I'd say as a business ourselves, and as an individual that is very passionate about irrigation, unlike many farmers, I do believe that our biggest threat probably is coming from excessive rainfall rather than excessive dry.

Int: So what are the possible solutions for dealing with that?

K: There's very little to be honest, and its very concerning because obviously the retailers have forced the price down so much that you can't afford to have a failure. There's been several times where I've been harvesting onions into November and it's very very depressing, and you know you are not going to get much for them when you've harvested them because the quality's not there and the way they price things now you can't afford that.

Int: And you said the main competition is with the Netherlands in terms of onion production. Are the factors affecting onions in the Netherlands and the UK very similar?

K: The Netherlands are very well placed in that they... firstly they grow a smaller crop because Europe (this is solely dealing with onions here), Europe prefers a 50-70mm size bulb, they like the smaller onions, and as a result you can sow your seeds closer together and you get a higher yield. So, yes, they get high yields, but they also have very very fertile soils. The Dutch Polders can achieve yields well in excess of 80 tonnes per Ha, whereas we would struggle quite often to get 60 tonnes per Ha, which makes them far more competitive, because when you are achieving 80 tonnes to a hectare, and that's say over, for instance, £100, that's £8000 per Ha rather than £6000 per Ha, and the production costs are exactly the same. But another interesting feature with the Dutch is that a lot of them are part time growers, so they have other income as well, so they tend to go in at weekends and farm their farms and, so it isn't quite so...

Int: What facilitates them being able to do that?

K: I think it's just a historical thing, a cultural thing in Holland. They tend to be smaller farms and they are just structured differently.

Int: You might expect their marketing to be more expensive then?

K: No, they have central marketeers that handle it all. And they are the ones that have the benefit from it if the price rises, so yes, we could do with a little bit less grown over there, but they don't seem to be interested in doing anything else.

Int: Actually that reminds me of a question that I should have asked you, which was about how much the area you farm has changed over time. Have you expanded a lot over time?

K: We've expanded over the last twenty years, since I've come in. But we've been fairly static in the last 7 or 8 years on area.

Int: When you do have a very good year and you have money to invest do you seek to diversify?

K: We've very much gone down the route of specialisation. You want a niche produce that you can command your own price for.

Int: So I can get them from ASDA?

K: They were at ASDA, they are now at Morrisons

Int: Morrison's has closed down in my local area, they keep closing down and reopening and building new supermarkets all about one minute away from each other.

K: There's a lot of that going on in with I don't know how many Tesco's it is, and probably the third Aldi going up and the fourth Lidl and I don't know, but um... Saturated.

Int: It seems like an excessive number of supermarkets!

K: Well they did go through the whole thing in the mid-nineties of just buying up sites and just sitting on those sites. They've obviously had a change of direction now. But now it's ALDI and LIDL that are buying sites left, right and centre, going through a massive expansion. But that'll stop I should think before long. We were in M&S with them last year, but unfortunately the buyer, apparently thought that it was taking too many out of his others, so he dropped it. Which to me I'd have thought it'd make more sense to continue it because you are getting a better margin off these than you are off those. I don't know because I'm not dealing directly with the buyer, I don't know. But we are

pushing them. We are doing an awful lot to export to Holland funnily enough, of our onions and I'm also exporting to South Africa, so yeah.

Int: So for something like this would you produce seed and allow others to produce the onions or is that not something you'd want to do?

K: We are still in the early stages, I'd probably try and keep it as a closed shop at the minute, although I am going out to America and going out to Washington State and Oregon and looking to produce it there, because people... whichever country you go to they do prefer to have homegrown stuff, and the logistics of getting it to the West Coast of America, it just doesn't make sense. Although last week we were discussing sending some containers to Japan, but I think it's too late in the season to be doing that. The focus we've got is Europe, UK and North America, but I'm also very keen to get into Asia, sort of Hong Kong, Singapore, Indonesia and Japan.

Int: And when you talk about conventional you are not talking about non-organic?

K: Conventional like you'd buy on the shelf, a standard pungent onion.

Int: But all production here is conventional?

K: Yes. When I say conventional I'm talking about conventional onion that you'd taste and its hot. Organic onions are produced, they are mainly produced in Holland, you don't get an awful lot of production in the UK.

Int: Is that because it's too ...?

K: It's because they are hard to do, and the returns just aren't there, they don't stack up.

Int: I suppose people regard onions as an essential item...

K: They are a core commodity.

Int: They don't want to pay over the odds.

K: Which is one of the problems we've had with this, because it um, people don't understand.		
People just see an onion and an onion is an onion.	ı	
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