



Horticultural Sector Committee

Corrected oral evidence: The horticultural sector

Thursday 8 June 2023

10.30 am

Watch the meeting

Members present: Lord Redesdale (The Chair); The Earl of Arran; Baroness Buscombe; Lord Colgrain; Lord Curry of Kirkharle; Baroness Fookes; Baroness Jones of Whitchurch; Lord Sahota; Baroness Walmsley; Lord Watson of Wyre Forest; Baroness Willis of Summertown.

Evidence Session No. 13

Heard in Public

Questions 140 – 158

Witnesses

I: Dr Mark Else, Head of Crop Science and Productions Systems, National Institute for Agricultural Botany; Samuel Larsen, Director of Programmes, Water UK; Richard Thompson, Deputy Director of Water Management and Investment, Environment Agency.

Examination of witnesses

Dr Mark Else, Samuel Larsen and Richard Thompson.

Q140 **The Chair:** Thank you for coming this morning. I will kick off with the first question. As part of that, could you also say who you are and the organisations you are representing? I should declare an interest as chair of the Water Retail Company.

Dr Mark Else: Thank you for inviting me, everybody. Good morning. I am a research scientist at NIAB at the site in East Malling in Kent. I have been there 25 years. I am a crop and plant physiologist with an interest in understanding how plants and crops interact with and respond to their environment, and how we can use that scientific knowledge to develop new methods of production that improve productivity, sustainability and resilience while also reducing emissions.

A key focus in the last 15 years of that research has been to try to use a combination of science-based and technology-based solutions to help growers improve their on-farm water use efficiency. We have experience in the soft fruit sector, so strawberries, raspberries, blackberries and blueberries; the tree fruit sector, so apples, pears, stone fruit, cherries, plums and so forth; the protected edibles and protected ornamentals sectors, under glass; and, more recently, vertical farming systems. Those are the key points of my expertise.

In terms of how climate change will impact on water availability for the horticulture sector, we will see longer growing seasons, of course, and high temperatures similar to those we saw in 2022. Both of those together mean that there is an increasing demand for water in the horticultural sector.

Over the last 10 years, we have seen an increase in the planting density and the intensiveness of farming. For example, the area under soft fruit production has remained roughly the same for the last 10 years, but the production from that same area has increased by between 17% and 25%. That extra production means an increasing reliance on water.

Most of the sectors within the horticulture industry rely on irrigation water to achieve the yields, quality and shelf life that consumers, retailers and customers demand. There are some rain-fed orchards in the west of the country but, by and large, the sector relies on a consistent and reliable supply of irrigation to achieve those yields and quality.

Samuel Larsen: Thank you for having me today. I am director of programmes at Water UK. I look after water supply issues for the water companies operating in the UK. Horticulture is a relatively small user of the public water supply. Many rely on their own local sources of water, either from local rivers or from boreholes. Nevertheless, it is important that horticulture has access to the water it needs for its businesses.

The risks that affect horticulture are the same as those that affect the water industry. Those climate impacts that were just described affect us

both because, ultimately, we all rely on the same sources for water, whether it be for horticulture or for the public water supply.

I would mention the work that the Environment Agency is doing on the new water resources framework, which is being upgraded ready for 2025. That will bring together these partners, all drawing on the same sources of water, to make sure that, in combination, everybody's plans balance out those climate risks that have just been described and the sources of water that people need.

Richard Thompson: Thank you for having me today. I am head of water resources at the Environment Agency, the environmental regulator responsible, with particular relevance to this committee, for safeguarding water resources in England. We regulate water abstraction for all sectors, including public water supply, agriculture, horticulture abstractors, energy and other businesses.

We also have a wider role to oversee the actions that water companies are taking to secure public supplies. As Sam said, we produce the national framework for water resources. The last version, published three years ago, identified a potential deficit of around 4 billion litres of water a day by 2050 if we do not take any further action to secure water resources. That is from a number of factors: meeting higher environmental standards; meeting increased demand in terms of population growth and potentially non-household demand, energy in particular; and mitigating and adapting to the effects of climate change.

On the impact of climate change, we expect there to be less water available overall. We are looking at about a 10% to 15% reduction by 2050. Changes in rainfall patterns are predicted to cause significantly lower flows in rivers in the summer. That is a particular problem for abstractors using water for irrigation. Although a relatively small amount of the water is taken from the environment—around 2%—there are particular challenges at the time that it needs to be taken, when rivers are running lower, groundwater levels are falling and demands are higher. At the same time, the water that is used is not returning to the environment. It is either being lost through evapotranspiration or uptake through growing crops and other food products.

There will be changes in the pattern of groundwater recharge, so aquifer levels may not always recharge over the winter, which they currently do. That will potentially make them more vulnerable to things such as saline intrusion. The change in the profile of water availability throughout the year will be particularly more noticeable, with more intense summer drought periods, like we experienced last year, higher temperatures and more intense summer storms, which have impacts on quality, turbidity and lots of other things that can affect abstraction.

As Sam says, we are in the process of upgrading our national framework right now. One of our key priorities is to build in further impacts of climate change, but also understanding the needs and risks for all sectors, not just public water supply.

Q141 Baroness Fookes: Given that it seems that water supply will be more changeable and less available, how will that impact the horticultural sector, in which we are particularly interested? How can it be mitigated?

Richard Thompson: There are probably two things to say. There are various sources of water for the horticultural sector. There is abstraction from groundwater, from the aquifers, direct abstraction from rivers and mains supply. For those who take water direct from rivers, the impact of climate change will be more noticeable. That will mean that what we call hands-off flow conditions, where abstractors cannot take water below a certain level, will be met more frequently. There will be more times over the summer where that water is not available to be taken.

How can that be off-set? There are a number of ways to do it. There are more efficient ways to water. Trickle irrigation, for example, is a far more efficient method of irrigation than big rain guns, spray irrigation and things such as that. I know that the horticultural sector is particularly advanced in using those technologies anyway.

So there is greater water efficiency to off-set that risk, alongside storage, where possible, which then gives the option to store water when it is available and use it at times when there is greatest need. Greater interconnectivity and working between water users could help make sure that we optimise the water use during those particularly difficult periods. It is largely a case of better techniques for water efficiency, more storage, and better connectivity and optimisation of the whole network, so that different users can have water when they need it.

Baroness Fookes: Is there a role of public water suppliers in the form of reservoirs? The Minister was actually speaking about that in answer to a Question yesterday afternoon.

Richard Thompson: There is, yes. If we can build the needs of other water users into reservoir design and location, those reservoirs could provide sources of water, not just in terms of increasing the capacity so that more people have access to mains water but potentially for use in other sectors.

I know that that is a particular aspiration of two new proposed reservoirs in the east of England, fenlands and south Lincs water. There is a regional group called Water Resources East, which is working right across the sector to look at what opportunities might exist, when water companies are building new infrastructure, to make use of that water for sectors such as horticulture.

Q142 Baroness Willis of Summertown: This is a slight side question here. I am curious to know what you do about quality of water for horticultural crops, given that these are directly eaten by people—although not the ornamental, I hope. How do you ensure that polluted water is not sprayed on crops?

Richard Thompson: A lot of the horticultural sector, protected crops in particular, will tend to use either mains water or groundwater. Because

groundwater comes from the aquifers, it is generally cleaner, less turbid and does not contain the same concentrations of pollutants. Direct river abstraction tends to be used more for agriculture and crop growing.

The conditions of an abstraction licence do not guarantee a certain quality of water. It is largely up to the sector and the individual abstractor or business to understand the quality of the water that it is abstracting and make sure that it is appropriate for use on its crops. Our work towards meeting the target and the aims of the water framework directive will improve water quality over time.

One of the biggest factors that will often impact abstractors is turbidity. Measures that can slow the flow, so it reduces the rate of runoff into the water, can have some quite significant benefits in terms of the quality of the water abstracted. They can also reduce flood risk and improve the resilience of water resources. We monitor right throughout the country for nutrients, chemicals and organic pollutants. That information is all available to help with the understanding.

Baroness Willis of Summertown: Sorry, I should clarify that. I worded my question badly. It was in relation to climate change. Given that the water supplies will be reduced, you will get an increase in pollutants.

Richard Thompson: Apologies for not answering that question correctly.

Baroness Willis of Summertown: No, it is my fault. I jumped ahead.

Q143 **The Chair:** Wastewater from sewerage plants can go straight into the river, but the Environment Agency counts that as waste, so you cannot use it on golf courses. Is that something that will change?

Richard Thompson: Is this about the direct reuse of water?

The Chair: Yes.

Richard Thompson: You may be aware that effluent reuse is already being looked at for securing public water supplies. One thing that is being looked at is the conditions that you would need to set to allow treated wastewater to enter any kind of system other than the natural environment in order to be used for water and irrigation. It is being looked at as part of our policy on effluent reuse at the minute.

Q144 **Baroness Buscombe:** I am carrying on with the subject of water quality. It is interesting that you mention effluence, Richard. As one who lives next to the River Thames, I can say that the local sewage pumping station is already happily pumping sewage into the river, and has been for years. That is an ongoing concern, of course.

In relation to the impact on the horticulture sector, perhaps I should ask Sam first, if I may, about the plan for UK. I know that Defra has suggested practical measures to reduce pollution and Richard has touched on some of them. Could you perhaps expand on some of those proposals and the practicalities, and say what you think about them?

Samuel Larsen: I will cover two things. The plan announced two weeks ago, which we will publish later this year, focuses on the steps on the ground that the industry proposes to take on the 15,000 storm overflows in the England. This is obviously a pressing issue for the public. The industry wants to speed up its efforts to tackle those 15,000 storm overflows across England. The plan will set out, overflow by overflow, the actions that the industry will take to address those overflows. That is one part of the issue.

The other part is nutrients. I am sure the committee knows about nutrients and how they pass through the systems, but I would just draw out a couple of points. Nutrients get into rivers and cause the issues that we know in rivers through two routes. The first is through the treatment of wastewater as it is treated through wastewater treatment works.

The industry's current programme, the WINEP programme, which we are delivering between 2020 and 2025—so we are roughly half way through the programme—introduces greater treatment at works to remove more of those nutrients before the treated water is released back into the environment. By the end of this current programme of investment that the industry is delivering, those works will be releasing far fewer nutrients into the river than, frankly, ever before.

The other part is from agriculture, so nutrients used for the production of crops, et cetera, as have just been described. Some of that is not well locked into the soil and it can run off more directly into the rivers and cause the same problem.

Much of the challenge ahead, in the way you have described, is about locking in more of these nutrients, finding ways of keeping them where they are needed—close to the plants—and reusing them time and again in the same system. At the same time, I hope more of that water can be reused on the same site as well, in the way Richard described, thereby relying less on nature, particularly in those summer periods where, as Richard said, we are trying to reduce the total amount of abstraction from the environment, as it itself tackles climate change.

Baroness Buscombe: We know that the Government are consulting on strengthening the Environment Agency's ability to issue monetary penalties for environmental offences in England and raise the cap for penalties. Do you think that this is something that could make a real difference, given that we have people running water companies who seem surprised that there is a problem?

I should declare an interest, having sat on the board of a water company. This was a problem a decade or 15 years ago. It is nothing new. No one should be surprised when it is decided that, this year, they do not take their performance pay. Do you think that it will make a difference?

Richard Thompson: I think that it will. One key way it will make a difference is probably the speed of the process. The Environment Agency being allowed to levy fines in certain circumstances will speed up the

process so that the impacts can be felt immediately by a water company, rather than three years down the line after a case has been developed and gone to court, by which time there might be a new board or CEO of a water company.

In terms of the speed of the process, it could and should make a difference and we welcome it. Will it solve the problem? No, because it has to be aligned with strategic investment in the system.

Baroness Buscombe: It is part of the matrix that could make a real difference.

Richard Thompson: Yes, those things have to happen in tandem.

Baroness Buscombe: Mark, is there anything you would like to add on this issue of water quality?

Dr Mark Else: We are trying to provide a very precise recipe for fertilisers. We are trying to reduce emissions to land, air and water by using predictive models to target fertiliser demand at different stages of crop development. If there is high background EC in the irrigation water, it makes trying to optimise that fertigation recipe challenging.

That is an issue for some growers who are perhaps using quite saline water. They often have to apply more water to flush out the deleterious ions in the substrate and prevent effects on yield and quality. In some parts of the country, saline water or water with a high background EC is a significant problem for growers.

Q145 **Baroness Willis of Summertown:** Leading on from that, Mark, we have heard a lot on this committee about technological robotics and things. Given that you are a scientist and the institute has "agricultural botany" in its title, I am interested to know whether there are some good news stories coming through about drought resistance, ornamental crops and the like? Where should we be thinking, "Actually, this is good"?

Dr Mark Else: There are challenges, but there are some fantastic opportunities. There has been some excellent research over the past 15 to 20 years looking at how we can develop new ways of growing to improve on-farm water use efficiencies. They include the precision irrigation systems that we have heard about. I already mentioned using predictive models to understand water and nutrient demand so we can better target those key resources at key developmental stages.

In some systems, just a short-term lack of water for a day or even a few hours can impact on quality, yield and shelf life, potentially. These closed-loop, smart, intelligent watering systems are key. They are available; we just need to help growers take them up on a wider basis. They need some support to do that. These systems have proven scientific benefits. They are available for growers to use; we just need to provide some support to help them to do that.

One thing we often talk about is responses of plants to a single stress. Often, we do not get a single stress; we have combined stresses. High-temperature stress also means that we have a water deficit stress. It can also result in a saline issue for plants. In the past, we have tended to look at stresses in isolation when actually we need to understand what the combined stresses on the plants are at any given moment. It is quite important to look at those different responses to combined stresses.

I should say that the current crop varieties, whether that be apple, pear, strawberry or raspberry, all have different genetic backgrounds. They have a different susceptibility to these stresses, so they begin to respond at a slightly different point. Much of the work we do is trying to understand, for a specific commercial variety, at what point it is too dry: at what point do we start to see effects of limited water availability on yield and quality? That gives us a framework within which we can target precision irrigation to make sure that we are using the water and fertilisers most effectively, but also trying to reduce emissions.

Baroness Willis of Summertown: Are you using precision breeding as well?

Dr Mark Else: Yes. I was just about to come on to that. It is fair to say that most of the targets of most breeding programmes are around flavour, ease of picking, colour and shelf life potential. I do not think that there is really a concerted effort to understand how those lines would perform under less than ideal conditions. It is a difficult thing to try to do, but an area of research that we are very interested in and keen on is trying to understand, before commercial varieties are released, how they fare under less than optimal conditions. There needs to be a big focus on that aspect.

Q146 **Baroness Jones of Whitchurch:** Can I follow up? I was listening to you talking about all the technological advantages—the good news, as Baroness Willis described it—but they all come with a cost. I am just imagining a closed-loop water system. That will have a significant cost. Is that a major barrier? Do you see the cost coming down? Is that something that you are having resistance from the growers on because they are saying, “We can’t afford this great technology that is on our doorstep”?

Dr Mark Else: That is right. Even though the cost of these systems has come down in recent years—we have better telemetry and remote sensing systems—cost is still a significant factor. Especially now, with the pressure on growers and the low margins, some of them do not actually know whether they will be in business next year. Investing in these high-tech solutions to improve on-farm efficiencies is perhaps not at the forefront of their minds. Cost is a significant factor, as is support.

Q147 **The Earl of Arran:** This question has been partly answered already. What are the barriers to implementing scientific and technological developments to support innovation in water management? We have covered some of that already, Mark, have we not?

Dr Mark Else: We have. Low margins for growers are a significant barrier at the moment. We need to acknowledge that. We need to provide more education to the whole sector. There is a feeling in some areas that, because water is vital, more water is even better. Of course, we know that that is not the case. We also know that plants are very highly adapted to limiting water conditions, so we underestimate the ability of the root system to extract water from the substrate or the soil. More education about why water is important is key, as is more training in some of the high-tech systems that we have talked about.

There is always a risk associated with change. A lot more support is needed for the grower community to adopt and embrace those technologies. The current Innovate UK-funded projects and Defra's farming innovation programme are fantastic. We often work with grower partners. We will implement some of these technologies over a hectare on their sites. What is missing is the support needed to take that technology being used on one hectare and scale it up across their 60 hectares. The support to help them do that is missing.

The Earl of Arran: Are we looking for more desalination plants to increase the amount of water?

Dr Mark Else: In lots of other soft fruit producing areas of the world, for example, using desalinated water is already a reality.

The Earl of Arran: Is it increasing in the UK?

Dr Mark Else: I do not think that we are at that level yet. That may be further down the line. Even with desalinated water, you then tend to introduce a boron toxicity problem. Using desalinated water is helpful but it is not without its own risks.

Q148 **Lord Colgrain:** My question is on the vexing issue of planning. How effective is the planning process for developing effective water management infrastructure? Richard, you talked earlier about storage where it is possible. Obviously horticultural businesses, if they have the land available, would like to be able to do it. Can you comment further?

Richard Thompson: Yes, of course. There was a commitment from government and the water companies, through the statutory water resource management planning process that we audit on behalf of the Secretary of State, to accelerate new water supply infrastructure. There is an explicit requirement within that process that they look at how they can actually use any new resource development to support other sectors, which I mentioned earlier.

How effective is the overall planning process? For the horticulture sector, one challenge that we face, if you are going to build infrastructure that might be multipurpose, is quite big and takes quite a long time to bring online, is having some confidence around future needs, what the needs will be and what activity will be undertaken in a particular geography.

One thing that we have committed to, and I am pleased we have got some government funding towards, is to help other sectors beyond the public water supply, which can do it for itself, to understand their future water needs better. They can then feed into these regional water resources groups and get some of the new, long-term planning infrastructure that will help them.

As for the short-term, I appreciate your comment. In horticulture in particular, land for storage is not available to them, so it is a case of other groups working together. We have also just announced some funding to support the formation of local abstractor groups, so groups working together to look at development of new resources, such as the Felixstowe Hydrocycle, where groups of abstractors work together to secure new resource.

We have had feedback because, through our National Drought Group, we work closely with representatives of the horticultural and agricultural sectors. Both have said that they face a couple of challenges when looking at some of this stuff. One is the fact that they often have to apply for a planning permission, a change in their abstraction licence or a new abstraction licence and secure their grant from things such as the Rural Payments Agency at the same time. That can be quite time consuming and difficult for these smaller businesses to do. We are looking at what opportunities there are to streamline that and make it easier to give people access to technical support so they can do that.

The other barrier that has been highlighted to us by the sector is the length of time that the Environment Agency has been taking to determine applications for licences. There was a backlog of 332 last autumn, but I am pleased to say that it has come down to about 188 now as a result of us being able to recruit about 50 new people. Also, some of the additional one-off work that we have been doing has gone through the system. We recognise that the length of time is still a challenge for us, but we are taking steps to try to make the process as smooth and easy as possible for anybody who needs water.

Samuel Larsen: For us, planning has two meanings. There is the local planning process, planning consent and development consent. Over the last couple of decades, it has been very difficult to get major infrastructure schemes, particularly in the water industry, through that local authority planning process. Reservoirs have been very difficult over the last couple of decades. There is one in Abingdon, for example, which is in plans but still needs to secure those local authority permissions.

We welcome Defra's work on the new national statement, which will help streamline the process for getting national infrastructure assets built in the UK, including some for water. There are seven new reservoirs in company plans for the period up to 2050. It is important that they get those consents but also that they receive approval via the economic regulator.

The second meaning of the word “planning” for us is about planning for the water that society will need and where it will need it. That is two parts in itself, really. The first is planning for homes. Homes are relatively straightforward to plan for. You can predict broadly the amount of water they will use and the fact that they will be occupied most of the time in the UK, in the majority of cases.

We do a lot of work with developers to make sure that the design of those homes relies not just on the water availability and the environmental stresses we see in the UK now. Those homes that are built today will still be in use in 100 years’ time, so we do a lot of work to make sure they are designed in a way that is as low stress on the environment as possible.

The challenge comes with businesses. Businesses are very different from homes. They are very dynamic in themselves. They are responding to pressures of inputs and market forces. Products may succeed or fail in the market.

As we move into this new framework that Richard described earlier that the Environment Agency is working on to bring all of these parties together, all these businesses in each of the five planning areas within the UK for water resources, that will be a really important step. It will be the first time that horticulture has been embedded into that process quite as much as it will be. It is important that those businesses that you described—those that want to find the right way of doing it—will need a bit of support with engaging, modelling, understanding, predicting and forecasting their own water demands so that they can play their part in that process that Richard is leading on developing.

Lord Colgrain: Can I ask you two further questions then, as matters of fact? First, when was the last public reservoir built? Secondly, how long is the planning process to have a reservoir built?

Samuel Larsen: For the first question, I think that there has not been—

Richard Thompson: It was Carsington, which I think was the 1970s.

Samuel Larsen: It was before the 1990s, but we can confirm the absolute date. It is not in the last two decades. Notably, there was a planning process in, I think, 1991 for the Abingdon one. Broadly, the conclusion of the planning process at that point was that it was not needed yet. Of course, things have moved on in the way that we have been describing. That is still in plans. We would still like to see approvals flow from that.

How long it takes is dictated a bit by the rate at which it progresses through each individual step. In the water industry we have a body called RAPID, which looks after the gateways for these assets. It looks after the design steps and the environmental investigations, and gets it through the planning process. It has a published timetable for all these things. We can share that with you afterwards if that would be helpful.

Lord Colgrain: It would be very helpful. I find myself, rather cheekily, thinking about how long it would take in China. I seem to recall being told that one of these permissions has been going for up to 20 years. This is not helpful to the industry.

Q149 **Baroness Buscombe:** We know we have a problem in different parts of the United Kingdom in relation to surplus and deficit of water. We also have an amazing canals network, which quickly went into decline, unfortunately, with the development of the rail system. Has anyone ever thought of using the canal network to transport water from the surplus areas to the deficit areas and otherwise, simply through pipework?

Samuel Larsen: I am glad you raised that. It is a really important issue. There are greater surpluses of water in the north and the west of the UK than there are in the south and the east, for the reasons we all know. There are the climate change impacts that Richard has described, which fall quite heavily on the south and the east. Also, there is population growth. There is big population growth in the south and the east, so increasing demand for water in areas where it is increasingly difficult to source it from the environment, as the environment is also struggling.

There is a useful graphic that we can send you, which sets out broadly the main schemes that we are proposing. Part of the RAPID gated process that I just described is about exactly that. It is about moving the surpluses from the north and west down into the south and east. Some of that is achieved by transferring water from one river system to another, because the river can then do the majority of the transport for you, similar to what other civilisations would have done in the past, but also relying on the canals. You are exactly right: the canals can do some of the heavy lifting for us.

Q150 **Lord Watson of Wyre Forest:** Can I take you back to water storage, specifically in horticulture? Can you explain to me whether the leaders of the water industry feel it is their responsibility to work with growers to increase their water storage in their businesses?

Samuel Larsen: What we are talking about today is helping everybody respond to the threats of climate change. We all, as customers, need to work together to save water. For the reasons described, water efficiency is important to us all. That might mean people installing water butts at home to meet their own demand. I have a 1,000-litre water butt and, as a family, we do not rely on a hosepipe in the summer. There is a storage solution at the small scale. At the large scale, it is equally important.

Water companies advise. We provide advice about water efficiency and what customers can do to respond to climate change and make themselves more resilient. That is easier to do for homes, for the reasons I described earlier. For businesses, there is lots of great advice out there. The Royal Horticultural Society has a lot of great advice for growers on what they can do. Some of it is directly about irrigation, but much of it is about finding ways of needing less water, being more accurate with how

you use it, but also trapping more moisture in soil by mulching and adding things to the soil that are capable of retaining it.

It cannot all be about supply. Part of the solution will be about storage: above-ground tanks, if we need to, on horticultural sites, but maybe, better still, ponds. Then we get the biodiversity gains as well, as nature is also struggling to respond to climate change.

Lord Watson of Wyre Forest: On that, could you tell us what resources are allocated to achieving that? What milestones has the industry set itself to monitor progress?

Samuel Larsen: In our water resources management plans, we set about maintaining the supply-demand balance in the UK in broadly three ways. The first way is through those water resources schemes that I described earlier, the RAPID schemes. We will provide some information on that, because I think that it is helpful.

The second is tackling leakage. Leakage has never been lower in the UK. We have been bringing that down year on year, but that needs to continue. More of that precious water needs to be captured in the pipes and delivered to customers.

Thirdly, there is the water efficiency point. That is in both homes and businesses. Water companies will be stepping up, as part of their plans for the next period, 2025 onwards, the advice that they give to customers to bring down that consumption.

Lord Watson of Wyre Forest: Beyond the advice—I think people know what has to be done and how you achieve that—does the industry itself have specific milestones, targets and resources allocated to the horticulture sector? If it does—you might not have it off the top of your head—it would be helpful if you could provide us with those detailed plans.

Samuel Larsen: Yes, sure. Let us follow up with something in more granular detail.

Q151 **Baroness Walmsley:** Following on from Lord Watson's question, at the level of an individual grower or group of growers, establishing further infrastructure for water capture and storage comes at a big capital cost. Richard, you mentioned grants a little earlier. I am aware of the water management grant. Can you tell me how big it is? Is it enough? How many growers or groups of growers have been able to obtain money for this sort of work from that pot of money? How unwieldy is the application process? You might write to us with more detail.

Richard Thompson: I will write to you with the exact details. I know that the fund has just been increased by 40% in the last few weeks. Is it enough to make a big difference? It can make a meaningful but not significant difference at the minute.

Is the process unwieldy? The individual processes are probably designed not to be unwieldy, but the combination of accessing a grant and the various permissions can be unwieldy. As I said, we are working with government to streamline this. It is not all in our gift because it is planning, the Rural Payments Agency and things like that, but we are looking to streamline that. I will confirm the size and uptake in writing, if that is okay. It has just been announced that it will go up by 40%.

Q152 Lord Curry of Kirkharle: We touched on this already in response to Lord Watson's question. Mark, you mentioned that some growers are uncertain about the future and are lacking confidence. Are we doing enough to provide either financial help or advice to professional growers, amateurs and gardeners such as me, who are obsessed with our gardens and cannot bear to see the plants wilting? Are we doing enough in terms of advice to help people be more efficient in providing a sustainable use of water?

Dr Mark Else: We have already mentioned the importance of training, guidance and education. That is across the professional and amateur sectors. We need to do that more effectively to help them understand the challenges and some of the solutions.

We also need to have demonstration sites where we can use water-efficient varieties, precision irrigation, and rainwater capture and reuse. Integrated together, we can demonstrate what is possible. Combined with that is robust benchmarking data to really help the growing community.

Lord Curry of Kirkharle: Does benchmarking exist now?

Dr Mark Else: It does. We have done several benchmarking exercises with colleagues at Cranfield in recent years. We have a demonstration site at East Malling, which is open to visit.

There is that benchmarking data there, but it comes back to the question about how growers achieve that benchmark. It is investment in science, technology and support. That is what is really needed to help us move from a very water-efficient hectare to a water-efficient farm. That support is what is missing at the moment. It involves scientists, agribusinesses, suppliers and growers. The whole raft of players need to be involved in that integrated facility.

Lord Curry of Kirkharle: I am interested in Richard's view on this as well. Are you saying that it is investment in science rather than capital investment in kit?

Dr Mark Else: It is both those things; it is investment in applied science, and helping growers invest in the outputs of that science and in the technologies needed to implement that.

Richard Thompson: As we talked about at the start of this meeting, given the impact of climate change, the availability of water and the acuteness of that impact, you probably need to invest in kit to make

things more efficient. Actually, there will probably be a need for even further water efficiency off the back of that.

Investment in R&D about how we make this process as efficient as possible is probably of nearly equal, if not greater, importance to infrastructure to provide water. As we find with the horticulture sector, that infrastructure is quite hard to come by and implement, so the efficiency of the techniques will be of real importance.

Q153 Baroness Fookes: Could we return for a moment to the provision of reservoirs and the excessive length of time it seems to take? You are going to give us an explanation of the various steps. Can you tell us now where the real main block is so we can perhaps decide how best to deal with that? Does it come from individual owners or local authorities?

Richard Thompson: It is fair to say that the water resource management plans have shown that some new strategic infrastructure needs to be developed. In the past, there has been reticence in terms of whether the evidence base has been sufficiently robust. There is a challenge there, and we have made it to the water companies, to say, "Whatever you're doing is going to have some impacts on a community, an economy or whatever it is, so you need to make sure the evidence base is particularly robust and stands up to scrutiny". That was not there in the past, which is why the plans for Abingdon were rejected 10 or 15 years ago by the planning inspector and Secretary of State. That is one of the challenges. The water industry needs to respond to that, which it is doing.

The rest of it is local opposition. As you might imagine, these things are locally very disruptive and carry impact over a number of years, in terms of construction, landscape and amenity.

So there are two prongs, really: there is whether your scientific evidence base makes a strong case for need and why this is the best option, then there is the work with the local communities and the local authorities to make sure that their needs are understood and catered for, and that the process allows that. Things such as the DCO process should effectively streamline it, but I do not think that that moves us away from the fact that there needs to be a good evidence base and good community engagement.

Baroness Fookes: Will this big strategic overview be helpful in that, inasmuch as there is a clear direction from above?

Richard Thompson: Yes, it will, because it clearly articulates the need. That can then be used to justify the long-term investment that is needed. It will help, but it still needs to be designed in the optimal way. That is for the water companies to do and we will audit them on that.

Q154 Baroness Willis of Summertown: We have heard a number of times that there is, in a sense, a sort of blockage with the science: you get the science so far in an individual field, but then you need to roll that out. Who delivers on that? Should SMEs be doing that? Is that where a lack of

support also comes in? I am curious to try to understand what is going on there.

Dr Mark Else: It is. The Innovate UK projects involve growers, SMEs and technology providers. It is a great collaborative process but it is almost limited to proof of principle. Further collaboration by those same players is needed, trying to focus on how we can upscale those solutions to a wider area.

Baroness Willis of Summertown: This might be part of the next session; I know that, in the EU, you get these follow-on grants to roll it out. Do we have the equivalent in the UK right now?

Dr Mark Else: We do not have as many as we would like. Often, within Innovate UK, for example, we will develop a new approach, a new piece of technology or a new outcome. We have tested that in, perhaps, one or two years on a commercial grower's site. There are lots of opportunities to roll that out more widely, but we often do not know all of the barriers to uptake that exist across the growing community. Every grower grows in a different way, so there are different barriers to uptake. If we do not understand what they are, we cannot provide solutions to help growers implement these technologies.

Q155 **The Chair:** We have been looking at food security as well as horticulture. Should horticulture, considering water is going to be a scarce resource, have a protected supply of water?

Richard Thompson: At the minute, over half of the horticultural holdings that we have data on are in catchments that are overlicensed or already overabstracted. If you were to give protected or preferential status to one type of use over another, that would potentially be to the detriment of either another abstractor—someone generating energy or someone who needs the water for public water supply—or the environment. We need to be very careful about saying that someone has preferential rights to water over another.

I recognise that we need to make sure that all sectors, all of which are really important to the economy and the well-being of the country, have the optimal access to water. Where we can provide flexibility in our process, we will. Where we can help understand water needs, we will. Where we can exercise things such as water trading and make that easier to use, we will do that as well.

I know that it is a key question that has come up quite often through our National Drought Group. Preferential use normally means at the expense of something else that is very important. The best approach is to try to make the best use of the water we have.

Q156 **Baroness Walmsley:** That partly answers my question, but you may have more to say. Richard, does the Environment Agency have sufficient and appropriate levers and resources to allow it to take action to protect habitats and crucial food growers at times of water stress?

Richard Thompson: We can control abstraction, in the sense that we can set conditions that mean that people have to stop at times of low flow. We have what we call abstraction licensing strategies and catchment plans, so when we make decisions we look at the interaction between all the different abstractors and all the different needs. We have powers through the Water Resources Act and the Environment Act to take action to remove, change or use abstraction licences.

One challenge, when you do not have any new water available, is that, to put more water back into the environment or make water available for other uses, you are taking it from somewhere else. Although the powers are there, we take great care to work with all those affected to make sure that we have the right solution. That can take time. We recognise that we probably should be doing that more quickly while making sure that that is not to the detriment of people who already have water rights.

The system can be improved and made more flexible with a move to the environmental permitting regulations, which is currently a proposal by government. That will give us more flexibility in how we manage abstractions.

Baroness Walmsley: When you mentioned that perhaps it could be done quicker, is that because of lack of resources? Is it the Environment Agency that sets the levels of river flow beyond which you would take action?

Richard Thompson: Yes, it is us. We use hydrological, hydrogeological and hydroecological models and science to set those. We can raise the money and the resources we need through charges, so we are not reliant on grant in aid from government. For this particular field, it is more a case of making sure the processes work for us. The most important thing is to have that network of abstractors and water users working alongside and with us to find the right solution. Building that connection, those partnerships, to regulate effectively is the biggest thing we need to do.

Q157 **Lord Watson of Wyre Forest:** I have a point of clarification, if that is okay. We heard at the start that there was a potential water deficit of 4 billion litres a day in 27 years' time—2050. Can you tell us what the contribution of that deficit is to the horticultural sector? What will horticulture be missing in its work within that figure?

Richard Thompson: That will be for the next bit of refinement. I can say that food and farming is about 500,000 of the 4 billion.

Lord Watson of Wyre Forest: Would you know what the impact on food and farming would be if it does not get 500,000 by 2050?

Richard Thompson: It would be variable, because the irrigation used obviously depends on weather patterns much more than things such as public water supply. It would have a significant impact on food security if we cannot secure that extra water.

Lord Watson of Wyre Forest: Mark, would you know what that might

do to the food supply?

Dr Mark Else: For those protected crops, it would basically mean that we would not be able to produce the fruit that we want to do in the UK. It would limit quality and quantity. Unfortunately, if they do not have access to reliable water supplies and cannot produce the crops they need, a lot of growers will go out of business.

Lord Watson of Wyre Forest: Sam, does the water industry agree with that analysis?

Samuel Larsen: Richard was quoting from the plans developed as part of the national framework. Those are the figures that, collaboratively, all those parties involved in the EA's framework have come to.

It is worth taking it back to the overarching solution here. Responding to climate change will require everybody to use a little bit less. Water efficiency targets are built into the plans that Richard has described. Achieving those everywhere that we can, in the home, in those businesses, on farms and in horticulture, gives us the greatest chance of having the water that we need.

The water industry plays its part by developing those schemes I described earlier that are in the RAPID plans. That is £14 billion-worth of investment in the run-up to 2050 to provide more public water supply. All that relies on everybody using water a bit more efficiently. There are lots of products, technologies and ways of achieving that. It is about supporting the development and application of that, because water efficiency helps everybody, including nature, respond to the climate risks that Richard described.

Richard Thompson: If I may add to my answer, although we are talking about a 4 billion litre deficit, that is not 4 billion litres of new water that needs to be found. We estimate that half that can be found through better use of water and more resource efficiency. We are not talking about lots of new water that we need to get from desal or move round the country. It is a combination of those things.

Q158 **The Chair:** What would you want from government, or more widely from the population, on this issue?

Samuel Larsen: I would quickly plug a really exciting product, which is biochar. Many of you might have heard of this. It is available at a small scale already. There are lots of feedstocks that could produce big volumes of biochar. The water industry has a great feedstock that could be used. We just need to scale it up. We need a bit of innovation; we need a bit of a kick-start to get that going, but there is a great solution there. It helps with the nutrient problem. It helps retain moisture in soils, which will become increasingly important.

Dr Mark Else: I would say follow-on funding to help growers and the industry implement this fantastic science and technology that we have developed.

Richard Thompson: Anything that helps the sector understand its water needs, facilitate the development of infrastructure where it is needed and develop new technology to reduce water use will be the biggest thing that we could do.

The Chair: That is the end of this session. Thank you very much indeed.