

**Notes of a meeting held on Tuesday 2 July 2019,
Committee Room 17, Palace of Westminster**

Driving productivity growth in British agriculture

Present:

Members

Julian Sturdy MP
Baroness Jones of Whitchurch
Lord Cameron of Dillington
Lord Grantchester
Duke of Montrose

Guest speakers

Sir Peter Kendall, AHDB
Alex Waugh, nabim
Dr Pete Berry, ADAS

Stakeholders

Sarah Blanford, Sainsburys; Helen Fox, BEIS; Jonny Hazell, Royal Society; Rob Quinlan, Royal Society; Tom Atkins, National Trust; Eleanor Kay, Scottish Land & Estates; Ian Cox, Innovate UK; Catherine Barrett, AIC; Mark Buckingham, Bayer; Karen Holt, Syngenta; Dr Julian South, MAGB; Andrew Swift, Fera; David Flanders, AgriMetrics; Maggie Charnley, Defra; Dr Penny Maplestone, BSPB; James Wallace, IAR Agri; Andrew Brown, TW Brown & Son; Mark Tinsley, PC Tinsley Ltd; Angela Coleshill, FDF; Tim Mordan, Defra; Jonathan Carruthers, RSB; Dr Tina Barsby, NIAB; Ginny Page, Gatsby; Brendon Noble, University of Westminster; Daniel Pearsall, Group Co-ordinator

1. Introduction

Julian Sturdy (JS) welcomed members and stakeholders to the meeting, and briefly introduced the topic for discussion, noting that the issue of productivity growth had been a recurring theme for the Group. He observed that UK agricultural productivity growth had fallen behind other countries, including other EU member states such as the Netherlands, Denmark and Germany operating under the same CAP policy regime, and recalled that Defra chief scientist Professor Ian Boyd had told the APPG's previous meeting that agriculture was at least three times less efficient than any other sector of the economy. And while the need to drive productivity growth had never been more critical for British agriculture - facing the most significant policy overhaul for 40 years, and the likely prospect of increased competition and reduced support as a consequence of Brexit - the latest statistics from Defra suggested that growth in Total Factor Productivity had not only slowed, it had gone into reverse with a 2% drop for the last full year reported.

JS noted that the meeting was therefore an extremely timely opportunity to hear about the work already taking place to drive improved productivity growth, as well as to consider and discuss what more needs to be done. He introduced the three guest speakers as follows:

Arable farmer and former NFU President **Sir Peter Kendall** chairs the Agricultural Productivity Working Group feeding in to the Food and Drink Sector Council as part of the Industrial Strategy. He also chairs the Agriculture and Horticulture Development Board

(AHDB), which leads on a number of initiatives to identify and tackle barriers to productivity growth in the industry.

Alex Waugh is Director General of nabim, the trade association representing UK flour millers. He plays an active role in cross-industry and Government policy groups working to improve prospects for the UK arable sector post-Brexit, and takes a particular interest in the potential role of data and sustainability metrics in driving productivity growth across the sector.

Dr Pete Berry, Head of Crop Physiology and Principal Scientist at ADAS, leads a number of research programmes focused on enhancing the yield, performance and efficiency of crop production systems.

2. Guest speakers

[Please note that all speakers' slide presentations are available to download via the meetings section of the All-Party Group web-site at www.appg-agscience.org.uk]

Sir Peter Kendall, Chair, AHDB

Peter Kendall (PK) opened by thanking JS and the All-Party Group for continuing to champion the case for modern, productive, science-based agriculture.

PK welcomed the fact that the food and drink sector was recognised within the Industrial Strategy, and as chair of the agricultural productivity working group feeding into the Food and Drink Sector Council, he highlighted the importance of the productivity report and recommendations presented to Defra Secretary Michael Gove the previous day, and the huge amount of work involved.

Emphasising the scale of the productivity challenge facing UK agriculture, PK compared the growth in Total Factor Productivity from 1991 to date in France – 82%, USA – 54%, Netherlands – 51% and the UK – 18%.

He underlined the need for the UK farming industry to improve its performance, noting that for every £100 spent, 56% of farmers currently get less than £100 back. There was a need for the farming sector as a whole to raise its game, but also to address disparities within sectors and among individual producers.

PK also stressed that agricultural productivity was emphatically not concerned with producing more, but with improving output in conjunction with sustainability and resource use efficiency.

PK explained that the productivity workstream report covered 13 different task and finish groups involving more than 150 different organisations and individuals, and that the mass of information feeding in to the report had ultimately been distilled down into recommendations in five key areas – Data, Knowledge Exchange, Innovation, Training and Professional Development, and Rural Infrastructure.

In relation to **Data**, PK highlighted the urgent need to recognise that the industry is not currently using or interpreting data in the right way, with too many software packages around from different sources that are not compatible with each other. He also noted the 'killer fact' that less than 20% of farmers benchmark in a professional, meaningful way – stressing the old adage that if you don't measure it, you can't manage it as the crucial starting point for raising the sector's productivity. The report's key recommendation on data therefore was focused on how to establish and drive an industry campaign around the introduction of a number of simple Key Performance Indicators (KPIs), possibly incorporated as part of the

farm accounts, which would enable individual farm businesses to monitor improvements in their productivity and provide comparisons locally, regionally and nationally.

PK noted that such benchmarking and comparisons between producers was already in place in some sectors of the industry, such as broiler production, and provided a strong motivation for individual producers to improve their performance.

He emphasised that another key issue to address was how to incentivise collection of farmers' data, how to improve the compatibility of different systems for collection and collation of data, and how to ensure the use and presentation of data/KPIs are 100% credible for all producers and sectors of the industry.

In relation to **Knowledge Exchange (KE)**, PK observed that compared to many other countries the UK's KE landscape was highly fragmented and often there was a lack of cooperation between different players. Here the working group's central recommendation was to establish an evidence for farming initiative as a go-to hub for information from a range of different sources, and to increase the network of demonstration farms, with farmer-to-farmer learning recognised as one of the most effective routes for KE and farm-level uptake of new technologies and practices.

PK also underlined the need to keep meetings fresh and to attract new participants, noting that with the prospect of removing support payments over seven years and at the same time opening up market access, it was vital to get farmers together to understand the scale of the challenge facing the sector – not to do so would be a dereliction of duty on the part of the industry and Government.

In relation to **Innovation**, PK highlighted the need for mission-led R&D, noting a common criticism that much of the R&D taking place is not focused on the current major challenges facing UK producers. He underlined the case for a new and wider discussion about immediate research and innovation priorities, and called for a greater collective focus on strategic transformative research, particularly in view of the recent Government's recent net zero carbon objective for the UK by 2040.

He also identified a need to improve the connectivity between R&D funding and more applied, transformational research, focused on the productivity and sustainability challenges facing the British farming industry – not spread too widely around solving other global R&D challenges not directly relevant to the UK.

In relation to **Training and Professional Development**, PK observed that far too few British farmers have professional qualifications, with just 18% of farms fully trained and professionalised, and 61% only having practical experience. With over 34 different organisations currently providing skills training in the farming industry, the working group's recommendation was to establish a single institute for agricultural and horticultural training and education, and an industry-wide campaign to ensure individual producers recognise the importance of professional training and skills for the UK to make the most of the fourth agricultural revolution.

In relation to **Rural Infrastructure**, PK noted the current dire state of the UK's digital infrastructure from a farming and rural perspective, and highlighted the need for 4G and 5G to be available based on area coverage not population. Without this, UK agriculture would not be in a position to fully exploit the opportunities to improve productivity through new digital and precision farming technologies.

Concluding, PK underlined the immediate need to get work underway in two areas: firstly the establishment of four or five simple KPIs to benchmark and drive improvements in individual producer performance at farm level, leading to the collection and collation of data at a

national level supporting transformative change across the industry as it enters a new digital revolution.

Alex Waugh, Director General, nabim

Noting that around 30% of all food products contain flour, Alex Waugh (AW) opened by providing a brief overview of the UK flour milling sector, which comprises 50 mills together producing 4 million tonnes of flour per year and using more than 5 million tonnes of wheat, around 4.5 million tonnes of which is sourced from UK farmers – the remainder imported from North America and other EU countries.

AW added that exports of flour and mixes accounted for around 8-9% of UK production, a growing export market worth around £250m, which combined with exports of bakery goods was worth around £1.2bn per annum.

AW explained that nabim had for years operated a benchmarking survey in the flour milling sector in which member companies participated anonymously, to provide an index of manufacturing costs across the industry. Starting in 1981, the index showed a steady increase in costs until 1996, when a major flour mill investment programme began in the UK, since when the index of costs had flat-lined on a nominal basis (ie not accounting for the effect of inflation), with energy the only segment of costs showing a significant increase which was entirely due to Government renewables charges.

As a result of keeping business costs measured and under control, AW noted that productivity within the UK flour milling industry had increased by 2.5% per year over the past 10 years, ie by more than 25% since 2008.

Turning to agricultural data, AW reiterated PK's observation that while the UK farming industry produced a huge amount of data, that information was not well shared or exploited either by farmers or the agri-food chain.

A major challenge therefore lay in improving the opportunity and incentive to share data within the farming industry, and building on that to agree consistent metrics and targets to measure, compare and assess progress in key areas such as productivity and sustainability.

AW noted that there were a number of initiatives around the world already well-advanced in this field, such as the US Field to Market programme, which worked at farm level and across the supply chain as a whole, and had demonstrated a tangible improvement in the 'fieldprint' of crop production in terms of resource use and environmental impact, measured per unit of output.

AW underlined that this approach to agri-metrics marked an important departure from traditional metrics of output per area farmed since it allowed productivity and sustainability to be combined within the same measurement.

Another example was the partnership between the Economist Intelligence Unit and Italian food company Barilla to develop a food sustainability index as a national measure to compare the performance of 67 different countries, in which the UK ranked 24th overall – and 18th out of the EU 28, behind France, Denmark and the Netherlands.

AW also emphasised that the countries performing well in terms of sustainability were also highly productive – a finding borne out by recent academic studies from the Universities of Cambridge and Munich respectively.

Having identified the need to manage data more effectively and using that data to establish metrics and targets for sustainable efficient production, AW acknowledged that another key factor to consider was motivation, and that this could best be addressed by finding a way to engage the entire supply chain. He noted, for example that the European countries

performing best in terms of productivity and sustainability – such as France, Denmark and the Netherlands – also had strong cooperative supply chains, providing a degree of trust that was perhaps currently lacking from the UK arable sector.

This presented a challenge to all businesses along the supply chain of how to generate a greater level of trust and cooperation which would give businesses the confidence to make the necessary investments for the future, allowing the entire chain to become more productive and more sustainable together.

In conclusion, AW noted that in the context of net zero carbon targets by 2040, alongside the evident need to drive improvements in UK agricultural productivity, there was an imperative to start now, even if it meant beginning with small, manageable steps in the first instance.

“Let’s not hang back, let’s get on with it.”

Dr Pete Berry, Head of Crop Physiology and Principal Scientist, ADAS

Pete Berry (PB) provided an introduction to the Yield Enhancement Network (YEN), noting that while the UK provides excellent environmental conditions for achieving high crop yields, with high levels of rainfall and solar radiation, average UK crop yields are either static or increasing slowly, and currently only reaching one third of their potential. Even the best-performing UK growers have significant scope to raise yields. YEN aims to help the industry understand and bridge that yield gap.

PB explained that YEN, operating now for six years, was based on four key pillars:

- Scientific understanding of yield formation;
- Benchmarking and analysis of meaningful yield metrics;
- Ideas for solutions to yield constraints;
- Testing those ideas in practice.

PB noted that the science behind yield formation was well-understood - summarised in reports such as the AHDB Wheat Growth Guide - setting out the key principles of converting water and solar radiation into biomass, and then partitioning as much of that biomass into grain as possible.

PB explained that YEN had moved on from its origins as a yield competition, with most farmers now entering a typical crop rather than their highest-yielding to improve their understanding of the factors driving yield growth. YEN covers cereals, oilseed rape, pulses and forage, and with several hundred farmers (300-350) now participating it represents a large and valuable data set covering a wide range of crops and performance – eg wheat yields within the YEN programme have ranged from 6t/ha (below the UK average of 8t/ha) up to the world record 16.5t/ha.

PB noted that YEN farmers particularly valued the benchmarking aspect, allowing individual producers to understand how they relate to other growers, and how to improve this performance. Each YEN farmer receives a comprehensive 20-page report for each field entered, identifying where the crop was performing well and not so well according to 67 different metrics, so supporting improved management decisions the following season.

PB added that the YEN data set as a whole was also providing valuable insights into the factors commonly associated with high yields – eg high yields are possible on virtually all farms and in all regions, and it is more about farmer behaviour and attention to detail than simply the amount spent or inputs applied. This was borne out by the fact that farmers who took the time to fill in more data about their management practices tended to have higher yields. Interestingly, farmers who had spent time working in other sectors of industry before coming back into farming were also linked with better performance.

The overall data also pointed to the specific physiological and husbandry factors associated with higher crop yields, such as wheat crops with more ears than average, first crops following a break crop, narrow row widths, applying slurry, as well as timely use of Nitrogen and other inputs.

In relation to the next stage of bringing together farmers, advisers, industry and researchers to test innovative solutions to address yield constraints and share the resulting data, PB introduced the ADAS concept of Agronomics as the science of on-farm decision-making.

This involves getting together groups of farmers (Farmer Innovation Groups - FIGs) to ask a common question, eg to compare the effect of different treatments applied to each tramline in a field, with all farmers conducting similar trials on their farm and sharing data to compare results, as well as taking advantage of the vast amounts of spatially referenced combine yield data available. PB explained that the trials were supported by industry and the research community to ensure they are fair and scientifically robust, giving farmers confidence in the results even if they only deliver marginal yield improvements. PB suggested that the aggregation of marginal gains could work for British growers in the same way it has worked for Olympic cyclists.

PB noted that so far the YEN approach had proved successful for engaging with farmers, generating meaningful data and benchmarking, identifying constraints to yield improvement and developing ideas and reliable tests for improving productivity. For greater and wider impact the project would need to scale up to 1000s of farmers, incorporate sustainability metrics such as carbon, water and biodiversity, as well as economic metrics – nb the record-breaking farmer achieving 16.5t/ha also had one of the lowest costs of production per tonne. It would also mean further developing the project's benchmarking capability and supporting a culture of on-farm testing to optimise crop management decision down to individual fields, and to integrate YEN with other farmer-led approaches.

On this point, PB noted that YEN was one of a number of initiatives aimed at improving yields and productivity, alongside Farm-INN, Innovative Farmers, AHDB Monitor Farms and others. To have the greatest impact these initiatives needed to be brought together, integrated and coordinated, and recently more than 20 organisations had come together to develop an overarching initiative called the Farm Productivity Enhancement Programme (Farm-PEP) as a concept to provide the underpinning support and infrastructure to drive productivity improvement on UK farms.

Questions and discussion

The following key points arose during discussion:

The opportunity to use common goals on agricultural productivity and sustainability to move away from R&D taking place in silos and deliver greater collaboration and coordination across all scientific disciplines, eg chemistry, genetics, engineering and IT.

The need to convince the broader farming community of the advantages of benchmarking and sharing data, beginning with a number of really simple, transparent KPIs to build confidence and trust, eg soil organic matter, fertiliser use per tonne of output.

The need for a single evidence hub to be fed into by crop and agronomy research organisations such as ADAS, NIAB, RRes etc was also highlighted.

The case for greater involvement of food processors and retailers to provide market "pull" for the widespread adoption of benchmarking and targets across the farming industry.

The unique opportunity for the UK in developing a new domestic agriculture policy to integrate farm performance data recording and collection as a condition of the transition to a new farm support regime, eg by simply paying farmers to collect and share data, or by making it a requirement of the new ELMS programme. Farmers could also be supported to collect and share data by making it easy – through investment in the development of automated processes and better compatibility and communication between different software packages.

The UK sugar beet industry was highlighted as an example of a crop sector which has seen continuous improvements in productivity and sustainability in both processing and crop production.

The need to factor in measurements of quality in developing metrics for productivity and sustainability – a recognition that output needs to match market demand.

The need to learn lessons from other countries ahead of the UK on productivity, eg France and the Netherlands. It was noted that professional skills and training had a much higher priority in those countries, and also their approach to novel issues such as using insect protein in animal feed was more progressive. And while R&D expenditure was on a par with these countries, was the balance right between fundamental, strategic and applied research in the UK? Some £400m was spent on agricultural R&D, but was too much going to fund peer-reviewed academic papers rather than research with practical impact? There was a big gap between the hundreds of millions invested by UKRI each year compared to the tens of millions spent by AHDB on applied research.

The potential influence of land ownership and land tenure on productivity and the ability to make long-term investments in farm infrastructure was also highlighted, raising the question of how to get land into the hands of the best, most efficient farmers.

The need for the farming industry to unite behind a campaign to drive improvements in sustainable productivity, similar to the Campaign for the Farmed Environment, which succeeded in avoiding compulsory set-aside.

The need to challenge farmers' entrenched view of entitlement to support – nb many YEN farmers are industry-sponsored and will not to commit to the £250 fee – and open their eyes to the prospect of running their businesses without support payments.

There was general acknowledgement that the introduction of KPIs and benchmarking may prompt a number of farmers to leave the industry – for some this proportion could be as high as 40%.

A recognition that the productivity challenge was not just about getting the less efficient producers to up their game using existing knowledge and research, but also about supporting the future improvements in genetics and agronomy to enable the most productive farmers to optimise their potential, and get closer to the estimated UK potential yields of 24t/ha for wheat, 11t/ha for oilseed rape and 30t/ha for grass.

Concluding the meeting, JS thanked guest speakers, members and stakeholders for their contribution to a lively and thought-provoking session which had helped to highlight some of the key issues at stake for driving future improvements in the productivity and sustainability of UK agriculture.

