

# DOUGLAS BOMFORD TRUST

## *Quarterly Update – Spring 2021*

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### *Spreading roots and new shoots....*

**Alan Plom**, Secretary to The Douglas Bomford Trust (DBT) reflects on the spreading roots of the Trust over a ‘virtual’ winter and looks forward to the new shoots of spring...

Over recent months our Trustees have held reviews with research teams nearing the end of their DBT-sponsored PhD projects and ‘start-up’ meetings for some interesting new projects for 2021. These include projects at two Universities new to us too: a study using UAVs (Unmanned Aerial Vehicles) to monitor the effects of Conservation Agriculture on soil erosion (at Worcester), and using LED lighting to improve crop quality in vertical farms (at Glasgow).

These projects meet the objective of the Trust to increase our collaboration with a wider range of Universities and with individuals who don’t recognise themselves as ‘agricultural’ engineers, yet are clearly contributing. The breadth of ‘agricultural engineering’ and its potential world-wide impact is also reflected in other DBT-funded PhD projects. These range from studies at Cranfield into use of polyacrylamide (PAM) spray to mitigate soil splash and capping, an in-field soil nitrogen diagnostic tool, and irrigation of sugar cane in Malawi. From developing a system of ‘virtual’ sheep fencing at Liverpool John Moore’s University, to using image analysis to monitor cows (at Nottingham). From devising flood mitigation strategies at Reading to developing a sustainable desalination plant at Birmingham, for application in the Jordan Valley.

Returning to grass roots (literally), we held a final review of the third project in the long term ‘Tillage and Traction’ study at Harper Adams University (HAU), which started in 2011. Part 3 has looked at the effect of low tyre pressures and CTF systems on soil properties and crop development, for 3 tillage systems, (in association with the University of Illinois). The virtual review involved representatives from all four co-sponsors - as was the start-up meeting to scope the next phase of this PhD-based research. Part 4 will focus on carbon capture in soil, to help farmers meet the Carbon Zero target.

At least having a virtual tour around the country for these meetings is reducing our own carbon footprint, whilst enabling more Trustees to be involved. We are also keen to see useful practical guidance for farmers coming out of our sponsored projects. With Conferences being deferred, we will be posting summaries and links to further information on our website asap.

We also look forward to a growing relationship with a new crop of MSc students at Cranfield, who will be continuing their Horizon-Scanning Project this spring. The team have been asked to identify and focus on key areas for potential future funding, including traceability, greenhouse gas emissions and energy efficiency.

### *New shoots*

**DBT Scholarships** - Interviews were also held by Zoom in December. This was a new experience for our interviewing panel as well as the students. As ever it was tough to decide, so congratulations to **Thomas Bowers, Robert Bryning, Will Flittner, Alex Williams** and **Rhodri Williams**. They will all be great ambassadors for the sector and we look forward to hearing about their activities. We hope to be able to meet them all face to face later in the year too.

**Grass roots competition** - Although this year’s applicants were all from Harper, this is an open competition and students on a relevant course at any college in UK can apply. Interviews are held in late November/early December and any interested lecturers or students should contact the Trust Secretary for further information.

One of our previous Harper Scholars, **Matthew Torok**, is no stranger to grass roots competition (literally!)....



### ***Matthew Torok cutting through the field....***

Matthew is an active supporter of IAgRE's Wrekin Branch and gave an online presentation about his 'hobby' Lawn Mower racing on 19 January 2021. Now in the third year of his Automotive Engineering (Off highways) MEng course at HAU, Matthew described his tentative first laps (aged 13) and progression in this 'grass roots' but highly competitive sport. It was good to see how he had used the Trust's funding to develop his vehicle - as well as his engineering and 'team management' skills *en route*. A complete recording of Matthew's presentation and the Q&A session is available on YouTube at: <https://www.youtube.com/watch?v=mW4d7-wo7To>

***Student Membership of IAgRE*** is sponsored by the Douglas Bomford Trust and we encourage all students on relevant courses to take advantage of your Membership. Now all IAgRE meetings are being held online, it is possible to 'visit' Branches around the country, as well as the regular Lunchtime Events. Topics covered already vary from aquaculture to safety. [I need a bit longer to think of a Z!] See: <https://iaagre.org/events>

***Supporting Farm Safety*** - With farm safety in mind, DBT is also supporting a (non-agricultural) MEng student at Bristol University who saw the potential for a sensing device to improve safeguarding of PTO shafts. To help develop the device, DBT's Chairman **Nick August** has been showing him the machinery on his farm - virtually, of course!

### ***Old Roots?***

***Meet a Trustee - Dr Paul Miller*** (FREng CEng CEnv HonFIAgRE) joined IAgRE as a student - in 1968! He is well known to most if not all readers, having been involved in agricultural engineering research and development throughout his long career and being actively involved with IAgRE as well as being the DBT's Secretary since 2010.

The last of our current 'technical' Trustees to be featured, Paul is used to handing out plaudits to students receiving the Trust's Scholarships and prizes at annual Awards Ceremonies, but he is very modest about his own impressive achievements.

Notably, Paul received the European Society of Agricultural Engineers (EurAgEng) '*Award of Merit for Scientific Understanding*' in 2016, for his "major international contribution to the advancement of scientific understanding in engineering and related science for the benefit of agriculture, environment, industry and the rural sector in Europe", as a "leading agricultural engineer and expert in all aspects of crop spraying and fertiliser application".



IAgRE's then CEO Alistair Taylor ( r ) presented Paul with a bronze replica of the 2.7m statue called 'Earth Man Tool and Sky' that stood at Silsoe Research Institute (SRI), where he worked from 1971 to 2005. Paul has been working on agricultural pesticide application since 1984 and led SRI's Chemical Application Group's research on spray drift from boom and air-assisted sprayers, nozzle performance, dose control and patch spraying. He went on to hold the senior role of SRI's Director of Technology. When the Institute closed in 2006, Paul was instrumental in setting up the Silsoe Spray Application Unit (SSAU), to continue their world-renowned research and consultancy as part of The Arable Group. He has been a visiting Professor of Cranfield University and is the author of many refereed and (international) conference papers.

Reflecting this, Paul was also elected as a Fellow of the Royal Academy of Engineering in 2016, in recognition of his "outstanding and continuing contributions to the profession," and being "one of UK's finest

engineers". The Royal Academy is committed to making the UK a leading nation for engineering innovation and just 1,500 engineers (from all engineering disciplines, in both industry and academia) have received this honour over the past 40 years. Paul and fellow Fellow of the Royal Academy (and previous Chair of our Board of Trustees) Professor Dick Godwin both currently represent the agricultural engineering profession.

Paul is currently on the Editorial Board of Biosystems Engineering and The Royal Academy's "Ingenia" publication. This includes stimulating and informative articles about all aspects of engineering and technology, from robotics and data, to the latest in renewable energy and medical technologies. Aimed at engineering enthusiasts aged from 10 to 110, its broad audience includes students and academics, engineering undergraduates and engineers at all levels. [See: [www.ingenia.org.uk](http://www.ingenia.org.uk) ]. Paul has also been Chief Examiner for The Property Care Association's 'Invasive Weeds' Group.

Paul has been a kingpin of the Trust since 2010. When he gave up his role as Technical Secretary in 2017, he left 'very large shoes' to be filled by his successor. Fortunately he kept his feet firmly under the table by becoming a Trustee. His breadth and depth of experience in research and commercial development means he is exceptionally well placed to assess the wide range of project proposals we receive. He is also able to give technical and practical guidance to PhD students (and their supervisors) involved in the cutting edge research and development projects sponsored by the Douglas Bomford Trust at Universities around the UK.

Paul has always been involved with IAgrE since his student days too. He has served on the Executive Committee and Council and became President (2006-08). He currently represents The Trust on these committees. In his 'spare time' Paul is trying to complete his 1/3<sup>rd</sup> scale Burrell traction engine and enjoys 'growing his own' on his allotment, so is never far 'off-piste'.

### ***Is the grass greener?***

An ex-Trustee who has also not strayed far 'off-piste' is **Dr Keith Hawken (Eur Ing Dr)**. Although Keith left our Board last November and emigrated to Portugal, he is still committed to advancing agricultural engineering by supporting projects with young people and the community in mind – helping to develop and pass on engineering skills and share his unrivalled knowledge of international standards. Keith is now the 'Engineering and Standards Coach' at the University of Evora in Portugal, as well as working with other Universities, ASABE in North America, Club of Bologna, the European Academy for Standardisation, EurAgEng Council, and IAgrE's Membership Committee.

### ***Can you 'cut it' too?***

If you are interested in helping the Trust and even becoming a Trustee, please contact the Trust's Secretary **Alan Plom**, via [enquiries@dbt.org.uk](mailto:enquiries@dbt.org.uk) or telephone 07951 527051. Further information about the Trust is available on Twitter @BomfordTrust and LinkedIn.