



## **SUPERGEN Bioenergy Members' Background and Research Areas**

### **Tim Barraclough – Rothamsted Research**

Scientific assistant investigating perennial grasses as potential energy crops. He is involved in the crop production of Miscanthus, Switchgrass and Reed canary grass specifically investigating the agronomy and crop quality for end users.

### **John Brammar – Aston University**

Process and economic modelling of bioenergy systems. CFD modelling of bioenergy and other system components. Combustion in gas turbines and boilers.

### **Toby Bridgeman – University of Leeds**

PhD research student investigating 'Torrefaction', a thermal pre-treatment process to enhance the quality of solid biomass fuels, and combustion properties of biomass and torrefied biomass, using laboratory and bench-scale equipment and an array of analytical techniques.

### **Tony Bridgwater – Aston University**

Tony Bridgwater is the manager of the SUPERGEN Bioenergy consortium, the BioEnergy Research Group (BERG) at Aston University, the IEA Pyrolysis Network (PyNe) and ThermalNet (which now includes GasNet and CombNet). Tony is also a member of the Bioenergy Network of Excellence (NoE).

### **Paul Carver – BiCal**

Director of BICAL Ltd, commercial growers and developers of Miscanthus for energy and alternative uses. Previously worked in plant research and have a PhD on the physiology of Miscanthus production in the UK.

### **Leilani Darvell – University of Leeds**

Area of work/research: Combustion of biomass particles in flames to obtain information about pyrolysis kinetics and char burnout kinetics. Her work includes fundamental studies of metal release from biomass in flames and some characterisation of biomass materials and waste woods.

### **Iain Donnison - Institute of Grassland & Environmental Research**

Iain Donnison's research covers underpinning research on dedicated energy crops and the impact of biomass quality on downstream energy conversion. One of the major traits being studied is the effect of plant cell wall composition on biomass quality for both combustion and fermentation based technologies. Research interests include - Energy grasses, fuel specification, crop quality and genetics of cell wall composition.

### **Romani Fahmi – Aston University**

Romani Fahmi is currently in the final year of a PhD at the Bio-Energy Research Group (BERG) at Aston University. His areas of interest are: - Characterisation of grass type in comparison with woody biomass, perennial crops and residues using TGA (thermogravimetry analyser), and Fast Pyrolysis of grasses in a fluidised bed reactor, with various sets and conditions, to produce a bio-oil for characterisation.

### **Paul Gilbert – University of Sheffield**

Paul Gilbert is currently in the first year of study for a PhD, entitled 'The Gasification of Biomass'. His current research focuses on the pelletisation of biomass for use in gasification. For the final

two years of study, he hopes to concentrate on the utilisation of biomass for small-scale use, looking at the key technologies available for example, Stirling engines for CHP.

### **Emma Gillespie – Tyndall Centre**

#### **Ed Hodgson – Institute of Grassland & Environmental Research**

PhD student looking at combustion quality traits in *Miscanthus*. At present, research is focused on analysis of 15 *Miscanthus* genotypes contributed from the European *Miscanthus* Improvement programme (EMI), utilising chemometrics to identify variation in lignin content. Lignin content will be used as an initial indicator of calorific value, and also to indicate which thermo-chemical conversion pathway is best suited to each variety.

#### **Jenny Jones – University of Leeds**

Jenny Jones is a Reader in Sustainable Energy from the Energy and Resources Research Institute at Leeds University. She is also an EPSRC Advanced Research Fellow. Her interest is in the fundamental studies of solid fuel combustion (coal and biomass). This includes experimental investigation and chemical modelling. Her most recent research concerns the behavior and fate of alkali metals in biomass pyrolysis and combustion.

#### **Paul Kilgallon – Cranfield University**

Paul Kilgallon is based in the Power Generation Technology Centre at Cranfield University. Research interests are materials performance in current and new power generation systems, the use of alternative fuels and the development of new processes that minimise environmental impact.

#### **Carly McLachlan – University of Manchester**

Carly McLachlan is a PhD student based at the Tyndall Centre for Climate Change Research at the University of Manchester. Her research focuses on stakeholder perceptions of bioenergy. This encompasses attitudes towards physical attributes of plants and crops and their associated infrastructure, as well as perceptions based on more socio-cultural aspects.

#### **Phillip Morris – IGER**

Secondary metabolism in crop plants (grasses, legumes, cereals). Manipulation of the chemical composition of forage crops and understanding how chemical composition affects forage quality Enzyme mediated degradation of grass cell walls. Developmental accumulation of secondary metabolites and plant response to biotic and abiotic stress. Use of transgenics to analyse metabolic pathways Phytochemistry of plant polyphenolics (tannins, lignin's, flavonoids).

#### **Mark Paulson – Coppice Resources Ltd**

Mark Paulson was previously a member of the Farmacy Chemical Trials Management Team with particular responsibility for interpretation and presentation of trial results. During this period Mark achieved qualifications in BASIS, FACTS and AMTRA, attended a FWAG course on assessing habitat management and became a LANTRA registered training instructor.

Mark Paulson now works at Coppice Resources Ltd and is responsible for the management and development of the company within the guidelines and strategy set by the Board of Directors. He specifically identifies and develops new market opportunities for all of Coppice Resource Ltd's activities and services, oversees the financial management of the company and delivers services alongside the company's sub-contractors and other directors and staff.

#### **Andrew Riche – Rothamsted Research**

Involved in research on the agronomy, economics and Life Cycle Analysis of all biomass crops (*Miscanthus*, switchgrass, reed canary grass, SRC willow and poplar). Also interested in conventional crops for bio-fuels e.g. wheat, sugar beet, oilseed rape. Research interests include - Biomass from dedicated crops (especially *Miscanthus*, switchgrass and reed canary grass), agronomy, economics, LCA, fuel quality, carbon cycling, potential UK production.

#### **John Rogers – Aston University**

PhD research student carrying out a techno economic appraisal of the use of biomass fast Pyrolysis oil for power generation and CHP application. He is investigating the fuel chain

between farm crop and energy distributor to try and establish the most economic structure for a practical industry.

**Ian Shield – Rothamsted Research**

Ian Shield is an agronomist and plant breeder with some 20 years experience on a range of crops. He is currently applying his knowledge and skills to energy crops (willow, Miscanthus, switchgrass and reed canary grass) at Rothamsted Research (research interests include agronomy, farm management and plant breeding).

**Jim Swithenbank – University of Sheffield**

Internationally pre-eminent for research on fluid flow & combustion: from rocket propulsion to energy from biomass/waste. He is also inventor of laser diffraction particle sizing and the FLUENT CFD code. Jim has a worldwide reputation for innovative investigations into combustion, gasification and pyrolysis of biomass/waste and the associated electrical power generation systems. In the relevant fields of waste and energy management for cities, Jim played a key role in developing one of the UK's first and still the largest district heating system with 150MW<sub>h</sub> currently connected. This is operated by Sheffield Heat & Power, using heat generated by burning domestic, commercial and hospital wastes.

**Simon Thain - Institute of Grassland & Environmental Research**

*Current research:* IGER Supergen project, Genetic specification of biomass/biofuel feedstock's in perennial grasses. Seek to (1) Provide consortium partners with a range existing perennial grasses in which extensive biochemical characterisation has been undertaken in order to test optimum biofuel specifications. (2) Using a "Mutator Maize" collection (non-GM) has developed Metabonomic tools to target the genes responsible for various elements of biofuel characters. The long term aim of the work is to provide essential information for breeding programmes to improve these traits in a range of perennial grasses including Miscanthus.

*Other interests:* Metabonomic approaches to study environmental responses of plant communities; flux control in metabolic pathways; circadian control of plant biology; development of novel metabolomic sampling techniques at cellular and sub-cellular leaves.

**Patricia Thornley – University of Manchester**

Patricia Thornley is involved in research assessing the environmental, social and economic impacts of bioenergy systems over the entire life cycle, from crop growth through to power production (Supergen bioenergy programme).

She is also a task leader in the area of technical and non-technical barriers to bioenergy on the EC Thermalnet project.

**Paul Upham – Tyndall Centre - Manchester University**

Bioenergy research interests include: public and stakeholder perceptions of bioenergy and renewable energy; land use planning issues; the climate mitigation potential of bioenergy coupled with carbon sequestration - for transport fuels (including aviation), heat and power.

**Alan Williams – University of Leeds**

Alan Williams has interests in modelling coal and biomass combustion and especially co-firing in power station situations. This relates to the basic combustion mechanism, the formation of pollutants including NO and smoke, and also deposition.

**Nicola Yates – Rothamsted Research**

A founder member of the Energy crop research team at Rothamsted Research. Research agronomist interested in all areas of energy crop production, specialising in the production of perennial grasses, switchgrass, Reed canary grass and Miscanthus.