



International Workshop

Advanced breeding programmes for sustainable crop and livestock production

2nd May, The Roslin Institute, Edinburgh

Background

This workshop will highlight current applications of genomic selection in crop and livestock production, identify challenges and applications for the implementation of genomic selection in plant and animal breeding programmes, and review the current tools and technologies available for genomic selection. The workshop aims to bring together leading researchers and industrialist from the plant and animal breeding sectors, which do not normally collaborate extensively with each other, to exchange knowledge and share best practice in crop and livestock breeding.

Presentations from experts in the field will provide delegates with an understanding of the state of the art in DNA analysis technologies, and quantitative and statistical genetic techniques applied to crop and livestock breeding. An overview of the new genomic techniques and the application of genomic selection in breeding programmes will provide an opportunity for delegates to identify, and exploit best practice across the plant and animal breeding industries.

Workshop aims

The workshop will aim to:

1. Highlight the most recent results from plant, and livestock genomics research groups and the current methods used for plant and animal breeding.
2. Identify new or improved ways of managing breeding programmes based on experiences from other agriculture sectors (animal/plant production).

3. Achieve consensus on the best ways to exploit the new genomic technologies to deliver faster rates of genetic improvement using marker-assisted selection.
4. Develop stronger interactions between the plant and livestock genetic research communities to enhance the application of genetics and genomics technologies within the livestock and plant breeding industries.
5. Foster new research collaborations that are focused on delivering benefits for the crop and livestock industries and improving the biological understanding of the genetic architecture of key traits.

Workshop Benefits

The benefits of attending this workshop will be:

- An updated understanding of the state of the art in DNA analysis technologies and quantitative and statistical genetic techniques applied to crop and livestock breeding.
- A detailed overview of the new genomic techniques and the application of genomic selection in breeding program optimisation and appropriate research and knowledge transfer opportunities.
- The creation of a multidisciplinary (international) collaboration between the main groups working in this area.
- Identification of opportunities to collaborate, such as on shared cyber-infrastructure and analytical tools.
- An initial exploration of the opportunities for research in improving breeding techniques to deliver improved food security both in the UK and internationally.

Programme

Time	Topic	Presenter
08.30 - 09.00	Registration	
09.00 - 09.05	Welcome	<i>David W. Burt</i> The Roslin Institute
09.05 - 09.15	Aims and Objectives	<i>Tom Jenkins</i> Biosciences KTN
<i>Session 1 – Genomic Selection: Opportunities and Applications in Crop and Livestock Production</i>		
09.15 - 09.30	An introduction to genomic selection	<i>Chris Warkup</i> , Biosciences KTN
09.30 - 09.55	Implementation of genomic selection in commercial pig breeding	<i>Dave McLaren</i> , Genus plc
09.55 - 10.20	Utilising genomic information in aquaculture breeding programmes	<i>Ross Houston</i> , The Roslin Institute
10.20 - 10.55	Challenges and advancements in poultry breeding	<i>Victor Olori</i> , Aviagen
10.55 - 11.25	Refreshments	
11.25 - 11.50	Implementation of genomic evaluations in dairy and beef cattle	<i>Mike Coffey</i> , Scottish Agriculture College
11.50 - 12.15	Challenges and opportunities to using genomic selection in outbreeding crops	<i>Leif Skot</i> , Institute Biological, Environmental, Rural Sciences
12.15 - 12.35	Challenges and opportunities to using genomic selection in inbreeding crops	<i>Ian MacKay</i> , National Institute Ag- ricultural Botany
12.35 - 13.00	Genomic selection in non-food crops	<i>Leopoldo Sanchez</i> , Institut National de la Recherche Agronomique
13.00 - 14.00	Lunch	
<i>Session 2 – Tools and Technologies</i>		
14.00 - 14.25	Statistical inference approaches in genomic selection	<i>David Balding</i> , University College London

14.25 - 14.50	‘Non-additive variance, algorithms and analytical tools’	<i>John Woolliams,</i> Roslin Institute
14.50 - 15.15	‘Generating New Sequence and Genotypes’	<i>Jerry Taylor,</i> University of Missouri
15.15 - 15.45	Refreshments	
Poster Abstract Presentations: Opportunity for delegates to give 5 minute presentation on their poster.		
15.45 - 16.15	Plant Breeding	
16.15 - 16.45	Animal Breeding	
16.45 - 17.15	Statistical models/bioinformatics	
17.15 - 18.30	Drinks reception and poster presentations	
18.30	Depart from the Roslin Institute to Edinburgh	
19.30	Workshop Dinner in Edinburgh	