**Design of breeding programs with genomic selection**

**Summer Course, Organized by INIA and School of Agronomy Faculty (UdelaR),**

**Montevideo, Uruguay, 17-20 October 2016**

**Instructor: Julius van der Werf, University of New England, Armidale, NSW, Australia**

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| **Date/time** | **Topic** |
| **Mon 17 Oct** | **Single trait selection** |
| 9.00 | Introduction to the course  |
| 9.15 | Improving selection accuracy, BLUP selection  |
| *10.30* | *Morning Tea* |
| 11.00 | Selection Theory 1: Change of mean, Two-stage selection |
| 11.45 | Selection Theory 2: Change of variance  |
| *12:30* | *Lunch* |
| 14.00 | Exercise on EBV accuracy *STEBVaccuracy.xlsm*Exercises on selection *Selint.xlsm, Truncsel.xls* |
| *15.30* | *Afternoon Tea* |
| 16.00 | Exercises continued and Discussion *Bulmer.xls* |
| 17.00 | Close |
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| **Tue 18 Oct** |  **Multiple Trait Selection** |
| 9.00 | Breeding Objectives and Multiple Trait Selection  |
| *10.30* | *Morning Tea* |
| *11.00* | Multiple Trait Index, Desired Gains and manipulating Response |
| *12:30* | *Lunch* |
| 14.00 | MT Selection Exercises *Mtindex.xls, MtindexEllipse.xls, MtindexDesGains.xls* |
| *15:30* | *Afternoon Tea* |
| 16.00 | Exercises continued and Discussion  |
| 17.00 | Close |
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| **Wed 19 Oct** | **Design of breeding programs** |
| 9.00 | Design of Breeding programs – overviewInbreeding, balancing inbreeding and selection |
| 11.45 | Optimizing Breeding Program DesignEconomic Evaluation of breeding programs |
| 12.30 | Lunch |
| 14.00 | Exercises Breeding Program design *Truncsel.xls* |
| 15.00 | Exercises Optimal Contribution Selection *xGxAx.xls* |
| 15.30 | *Afternoon Tea* |
| *16.00* | Exercises in Evaluating Breeding Programs  *Gflow.xls, Cost Benefit BP* |
| *17.00* | Close |
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| **20 Oct** |  **Using Genomic Information** |
| 8.30 | Accuracy of genomic prediction |
| 9.30 | GBVs in Genetic Evaluation, Selection Index, BLUP |
| *10.30* | *Morning Tea* |
| 11.00 | Genomic selection in breeding programsImpact on optimal response, Inbreeding, Crossbreeding |
| 11.45 | Design of reference populations, Genotyping strategies |
| 12:30 | *Lunch* |
| 14.00 | Exercises GBV Accuracy  *MBV Accuracy.xls* Exercises: Incorporating genomic predictions in EBV *STEBVaccuracy.xls, mtindexGBV.xls*  |
| 14.45 | Exercises: Optimal breeding programs with Genomics Selection *Gensel.xls CrossBrGS.xls*  |
| 15.30 | *Afternoon Tea* |
| 16.00 | Discussion of Case Studies  |
| 17.00 | Close |