**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 – overview  Inbreeding, balancing inbreeding and selection | | |
| 11.45 | | | Optimizing Breeding Program Design  Economic 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 programs  Impact 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 | | | |