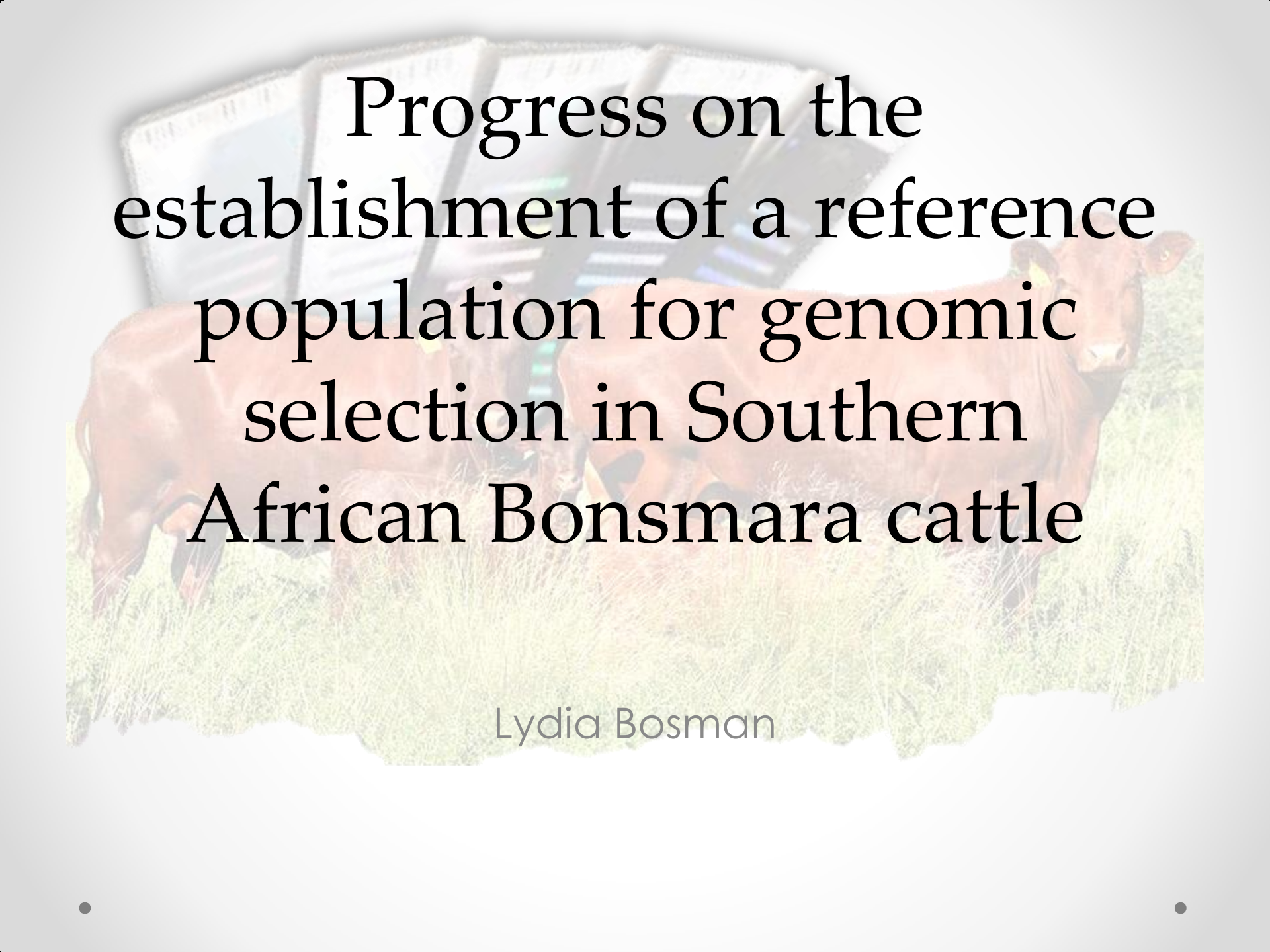


The background of the slide features a photograph of two brown cattle standing in a green field. Overlaid on the upper left portion of the image is a detailed, semi-transparent image of a DNA microarray chip, showing its grid of spots and associated electronic components. The title text is centered over the image in a large, black, serif font.

Progress on the establishment of a reference population for genomic selection in Southern African Bonsmara cattle

Lydia Bosman

The Bonsmara

- In South Africa, no reference population for a beef breed has been established to date
- Currently more than 120 000 registered cattle
 - 2010: 91 637 cows
- Mandatory performance recording
 - Reproductive traits – ICP, age at first calving, direct BW, maternal BW, etc.
 - Growth traits – Mature weight, ADG, FCR, intake, carcass traits
- Large number of accurate records

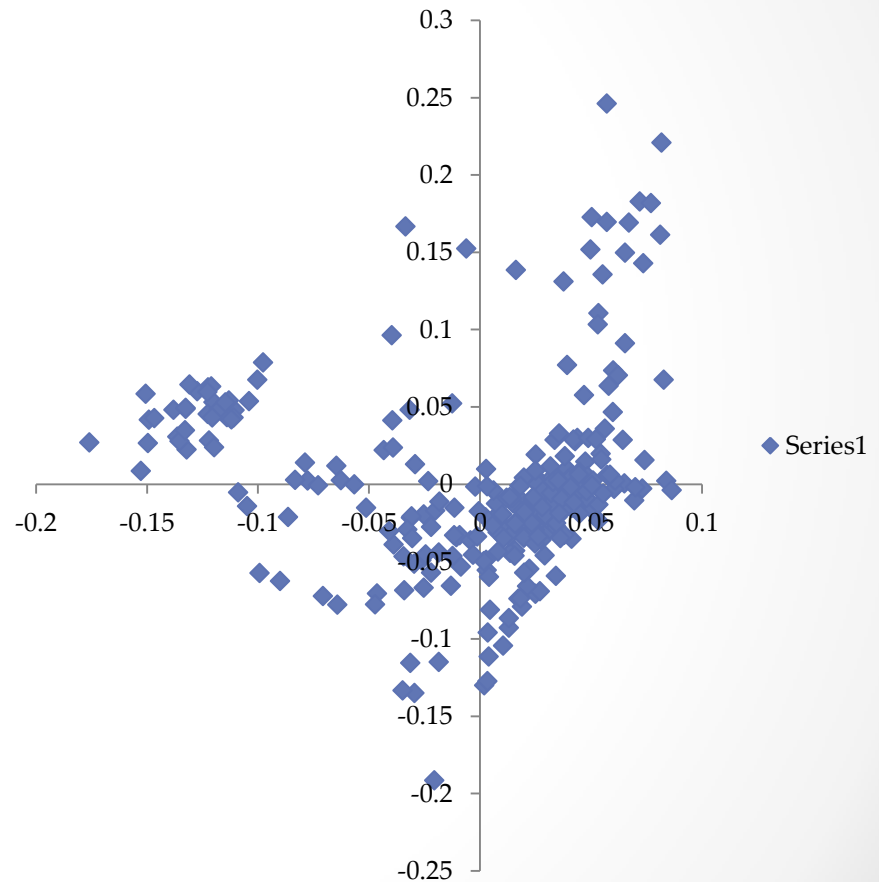
Genotyping

- Establishment of reference population
 - SA Bonsmara Breeder's Society and SA Stud Book
- Collect biological samples of bulls that:
 - High impact (Both good and bad)
 - Available phenotypic data
 - EBV accuracy of more than 65% (all traits)
- Goal to genotype 1 000 animals
 - Hair sent to Geneseek (Lincoln, NE, USA)
 - Genotyping with GeneSeek® Genomic Profiler Bovine HD™ Chip (GGP-HD)
 - 78 000 SNPs

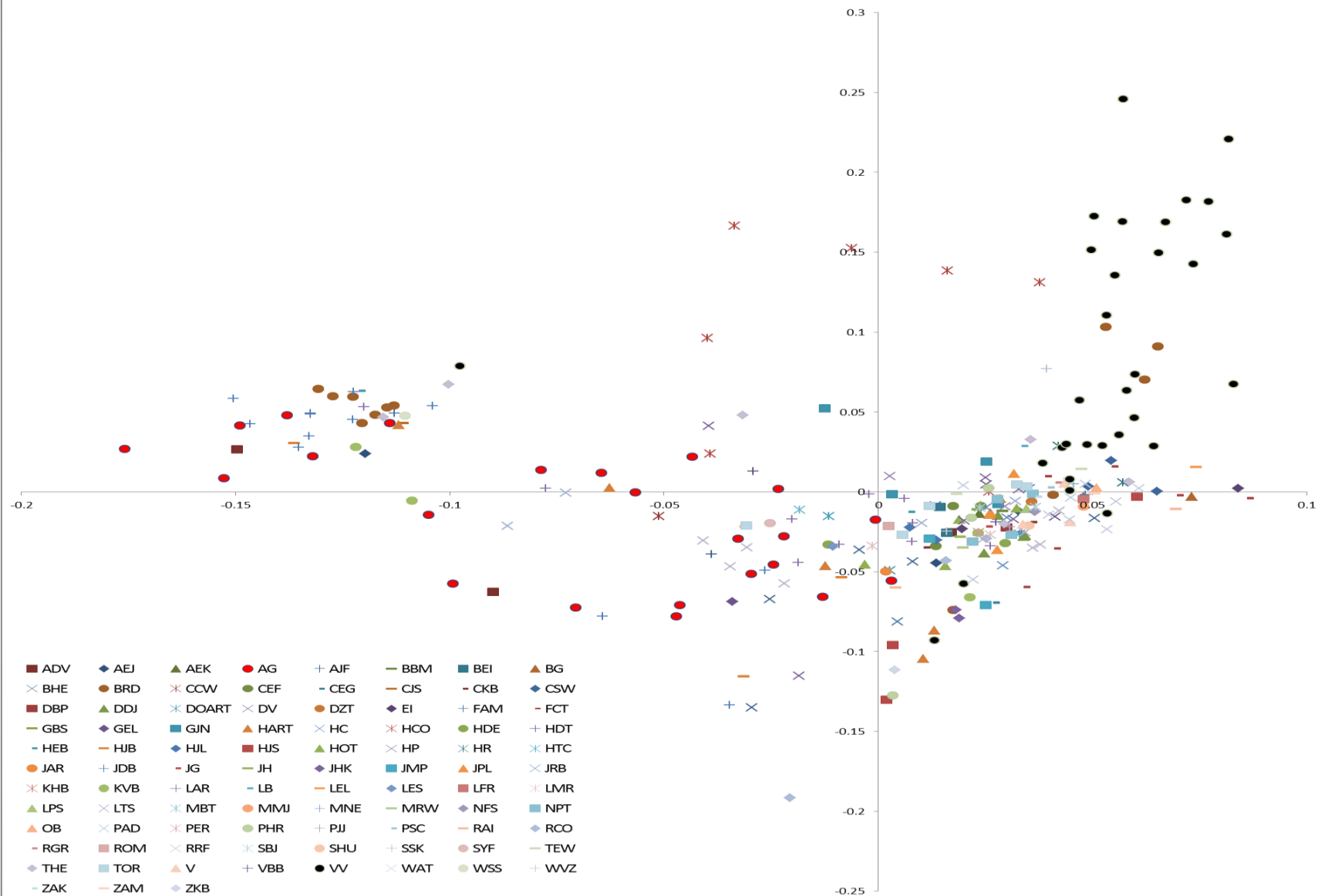


Data

- To date, 299 bulls and 3 cows have been genotyped
- Quality control
 - plink (Purcell et al., 2007) – missing individuals, missing SNP's, MAF
 - Also frequencies
 - gcta (Yang et al., 2011) – estimate PCA



By Herds



The Future

- More genotypes – include more females
- Population structure
- Genomic correlations
- Estimation of GEBVs and DGVs for the Bonsmara
- Validation of GEBVs in population
- Development of a lower density chip for imputation

The Beef Genomics Project

BGP Management Team

Representative	Affiliation	Expertise	Role
Dr John Becker	African Centre for Gene Technologies	Biotechnology Collaborative networks	Management team convenor
Prof Jasper Rees	ARC	Agricultural genetics and genomics	Management team member
Dr Norman Maiwashe	ARC	Animal improvement and production	Management team member
Prof Este van Marle Koster	University of Pretoria	Genomic selection and animal improvement	Management team member
Dr Michael Bradfield	Service provider	Animal recording and improvement	Management team member
Dr Japie van der Westhuizen	Service provider	Animal recording and improvement	Management team member
Mr Thys Meyer	Stud breeder	Cattle breeding	Industry representative
Mr Johan de Jager	Stud breeder	Cattle breeding	Industry representative
TIA representative	Technology Innovation Agency	Agricultural innovation	Government/funder representative Management team member

Implementation Plan

- Involvement of 17 largest breeds > 95% involvement
- If 8 smaller breeds included > 99%
- Also include some Namibian data (and few herds in other Southern African countries)
- Focus on:
 - Female fertility
 - Maternal ability
 - Feed intake
 - Carcass properties
 - Meat eating quality
- Some focus on Small Farmer development

Thank you

