‘Swans Lagoon’

Benchmarking and Herd Improvement using BREEDPLAN

‘Swans Lagoon’ Research Station is owned and operated by the Queensland Department of Primary Industries and Fisheries (DPI&F). It is located South West of Ayr, North Queensland in the harsh dry tropics, northern speargrass region. The breeder herd has been comprised of a nucleus herd of approximately 150 breeders and a commercial research herd of up to approximately 1500 mated breeders.

The ‘Swans Lagoon’ herd has been closed to outside genetics for approximately 30 years. Research on the property has focused on traits that have not required importing of new genetics. The present ‘Swans Lagoon’ genotype is described as 5/8 Bos indicus 3/8 Bos taurus genotype. This genotype resulted from the initial AI of Shorthorn cows to Brahman sires.

In 2004, the Department of Primary Industries and Fisheries decided they needed to 1. benchmark the herd with Industry and 2. objectively improve productions traits in the nucleus herd. In discussions with Tropical Beef Technology Services (TBTS) and the Droughtmaster Breed Society, it was decided to join Droughtmaster GROUP BREEDPLAN to accomplish this goal.

Droughtmasters are the closest comparable genotype and it was therefore most appropriate to commence a genetic analysis with that society.

Performance data for 8 calf drops (1997 to 2004) was included in the 2004 Droughmaster GROUP BREEDPLAN analysis. The resultant EBVs are considered within-herd only as the ‘Swans Lagoon’ herd currently has no genetic linkage to existing Droughtmaster BREEDPLAN herds.

To produce the required genetic linkage an AI program has been undertaken with sires that have been used in other Droughtmaster BREEDPLAN herds. Approximately 200 females have recently been inseminated to existing ‘Swans Lagoon’ sires and the select Droughtmaster sires. Existing ‘Swans Lagoon’ sires are being used so direct comparisons can be made between their calves and those of the Droughtmaster sires. This will also provide genetic linkage back to earlier calf drops that only have calves from the ‘Swans Lagoon’ sires represented. An additional 200 ‘Swans Lagoon’ breeders are being single sire mated to either ‘Swans Lagoon’ or Droughtmaster sires.

The Droughtmaster sires were selected with input from DPI&F staff, Droughtmaster breeders and TBTS. The selection criteria for the bulls were:

- Top 25 % and higher for growth and Scrotal Size EBVs.
- High accuracy in EBVs.
- Also to be used in at least 1 other herd producing progeny with EBV’s.
- Tidy Sheath.
- Scrotal size above 34 cm at 2 years of age (depending on nutrition).
- Dam fertility records.
- Pass a bull breeding soundness evaluation.
- Adapted to Northern Queensland environment.

The existing sire selection on Swans lagoon has been primarily based on bull fertility measures (Bull Breeding Soundness Evaluation BBSE) in association with the requirements for many research studies.

To boost the numbers in the Swans Lagoon breeding program it will be replicated in two other pedigree recorded Droughtmaster herds situated in North Queensland. These herds are Lisgar Droughtmasters (Home Hill) and Glen Ruth Droughtmasters (Hughenden). 120 females at Lisgar and 150 females at Glen

<table>
<thead>
<tr>
<th>Sire ID</th>
<th>200 d Wt</th>
<th>400 d Wt</th>
<th>600 d Wt</th>
<th>SS</th>
<th>Mate Type</th>
<th>Natural &amp; AI</th>
</tr>
</thead>
<tbody>
<tr>
<td>WS602622M</td>
<td>+7 (63%)</td>
<td>+17 (63%)</td>
<td>+28 (65%)</td>
<td>+1.3</td>
<td>70%</td>
<td>AI</td>
</tr>
<tr>
<td>WS699777M</td>
<td>+10 (71%)</td>
<td>+27 (72%)</td>
<td>+38 (72%)</td>
<td>+1.0</td>
<td>72%</td>
<td>Natural</td>
</tr>
<tr>
<td>JA199975M</td>
<td>+11 (76%)</td>
<td>+14 (78%)</td>
<td>+20 (79%)</td>
<td></td>
<td></td>
<td>Natural</td>
</tr>
<tr>
<td>DGM9973M</td>
<td>+21 (81%)</td>
<td>+37 (82%)</td>
<td>+54 (83%)</td>
<td>+1.4</td>
<td>81%</td>
<td>AI</td>
</tr>
<tr>
<td>QT80236M</td>
<td>+1 (64%)</td>
<td>+5 (64%)</td>
<td>+8 (67%)</td>
<td></td>
<td></td>
<td>Natural</td>
</tr>
<tr>
<td>Breed Average</td>
<td>+2</td>
<td>+3</td>
<td>+5</td>
<td>+0.1</td>
<td></td>
<td>Natural</td>
</tr>
<tr>
<td>Top 25 %</td>
<td>+5</td>
<td>+7</td>
<td>+11</td>
<td>+0.4</td>
<td></td>
<td>Natural</td>
</tr>
</tbody>
</table>
Ruth will be AI’d to either the ‘Swans Lagoon’ or select Droughtmaster sires. This will provide strong genetic linkage, which is essential in the GROUP BREEDPLAN analysis.

The inclusion of the ‘Swans Lagoon’ herd in Droughtmaster GROUP BREEDPLAN will also provide an excellent opportunity for the demonstration and expansion of another tropically adapted performance tested genotype and provide effective selection information for the northern beef cattle industry.

All involved in this program are waiting in anticipation for the first genetic comparisons of performance between calves from the ‘Swans Lagoon’ and Droughtmaster sires. This will occur mid-2006.

For further information on the ‘Swans Lagoon’ Breeding program or Droughtmaster GROUP BREEDPLAN:

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BREEDPLAN Extension
Team work gets the message across

This February over 110 producers attended a BREEDPLAN focused field day which was run at Neil and Rosalie Watson’s property ‘Watasanta’, Tamworth.

Neil and Rosalie Watson have been members of Santa Gertrudis BREEDPLAN since 1999. They started with John Bertram (Goondiwindi DPI&F) in the yards explaining the relationship between and animals looks and genetic differences. Four heifers were used to explain how basic genetic differences (or EBVs) are created. Their raw weights were adjusted for age and then converted to in principle EBVs. John interacted with the audience to discuss other factors that can affect raw performance (such as nutrition and age of dam) as well as traits that are economically important in breeding programs.

David Greenup, ‘Rosevale Santa Gertrudis’, Jandowae, then used the groups of animals and experiences from ‘Rosevale’ to further explain how EBVs are calculated and interpreted. For example, David explained the scrotal size EBV using a group of yearling bulls and the data used to derive their EBVs (Table 1).

The evidence that EBVs are a powerful female selection tool was shown when a group of 3 cows and calves (by the same sire) where bought into the yards. The raw performance of the calves mimicked the age of dam) as well as traits that are economically important in breeding programs.

However, David Greenup then raised an interesting experience from a field day at ‘Rosevale’ in 2004. Two yearlings bulls were bought into the yards, one being obviously more eye appealing than the other. He asked the audience to pick which bull they would prefer to take home. With their eyes being their only selection tool 95% of the audience selected the more eye appealing bull. David then surprised the audience by announcing they were identical twins (from a recent DNA profile). The difference in looks came about from one being fed a concentrated ration for a couple of months and the other being fed natural pasture while running with cull cows. In this situation, which could be extrapolated to many bull sales, the majority of the producers paid for the feed not the genetics.

Other topics discussed were data quality (Michael Rush, BREEDPLAN), Proof of profit using EBVs (Christian Duff and John Bertram) as well as fertility and structural selection points in bulls (John Bertram, Burnett Joyce, ‘Gyrama Santa Gertrudis’ and Anthony Coates, ‘Eidsvold Station Santa Gertrudis’).

All speakers involved were very interactive with the audience and constructive discussions took place the entire day.

Christian Duff

Table 1: Data used to show how the SS EBVs are derived:

<table>
<thead>
<tr>
<th>Bull Tag</th>
<th>Sire</th>
<th>Raw SS</th>
<th>Age (days)</th>
<th>Age Dam</th>
<th>Adj SS</th>
<th>SS EBV</th>
</tr>
</thead>
<tbody>
<tr>
<td>618</td>
<td>W Watabull</td>
<td>42</td>
<td>394</td>
<td>5</td>
<td>43</td>
<td>+1.1</td>
</tr>
<tr>
<td>574</td>
<td>W Watabull</td>
<td>34</td>
<td>445</td>
<td>6</td>
<td>33</td>
<td>-1.0</td>
</tr>
<tr>
<td>582</td>
<td>C Alifie</td>
<td>39</td>
<td>441</td>
<td>5</td>
<td>38</td>
<td>+0.2</td>
</tr>
</tbody>
</table>

In the pictures above:
Top: The audience at the “Watasanta” field day

Adj SS: Adjusted scrotal size is the raw scrotal circumference measurement adjusted for both the age of the animal at measurement and the age of the animal’s dam. Measurements are adjusted to that from a standard 400-day old animal born from a 5-year old dam.

SS EBV: The Estimated Breeding Value for Scrotal Size is based on differences in the adjusted scrotal sizes of animals and also takes account of the heritability of scrotal size. Heritability is a measure of the proportion of the differences between animals within a management group, which is genetically controlled and will therefore be passed on to progeny. The heritability of scrotal size is 0.40 or 40%, which is why EBV differences are considerably less than differences in adjusted measurements. The remaining 60% of the measured difference is due to the environment and measurement errors.

Any BREEDPLAN member interested in running a BREEDPLAN focused field day on farm can contact: BREEDPLAN 02 6773 3555, Christian Duff, TBTS 07 4927 6066 or their association.