



# final report

**Project code:** P.PSH.0337  
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**Date published:** October 2011  
**ISBN:** 9781741916492

**PUBLISHED BY**  
Meat & Livestock Australia Limited  
Locked Bag 991  
NORTH SYDNEY NSW 2059

## Tropical Beef Technology Services

Meat & Livestock Australia acknowledges the matching funds provided by the Australian Government to support the research and development detailed in this publication.

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## Abstract

Tropical Beef Technology Services (TBTS) is a joint initiative between Meat and Livestock Australia (MLA), the Agricultural Business Research Institute (ABRI) and nine tropical Breed Societies. The TBTS project began in August 1997 after it was recognised that the level of BREEDPLAN performance recording in tropical seedstock herds was at a far lower rate compared to their British and European breed counterparts.

The TBTS project has contributed to there being a significant number of animals within seedstock herds, and bulls available to commercial industry, having accurately described genetics. This is through published BREEDPLAN EBVs for a range of traits and Selection Indexes. While the number of BREEDPLAN herds and percentage of animals with at least one post-birth weight recorded for genetic analysis purposes has plateaued, the percentage of animals being recorded for other traits of economic importance such as fertility, carcase and temperament has significantly increased.

The improvement in profitability via genetics is most effectively estimated using the combined Brahman and Santa Gertrudis Selection Index trends. The net dollar (\$) gain to the northern beef industry via Brahman and Santa Gertrudis genetic improvement (over the term of this project) is conservatively estimated to be \$4.5 million per year.

This genetic progress (in \$ terms) has been achieved through a range of communication activities including 2 webinar courses, 20 workshops/field days with an estimated audience of 601 producers, 51 on property visits and a biannual technical newsletter for seedstock producers.

The TBTS project is currently in its 5<sup>th</sup> term and 14<sup>th</sup> year of operation. All stakeholders have supported to continue for a further 4 year term.

## Executive Summary

Tropical Beef Technology Services (TBTS) is a joint initiative between Meat and Livestock Australia (MLA), the Agricultural Business Research Institute (ABRI) and nine tropical Breed Societies. The TBTS project began in August 1997 after it was recognised that the level of BREEDPLAN performance recording in tropical seedstock herds was at a far lower rate compared to their British and European breed counterparts. The following information relates to the 4th term of the TBTS project which ran from July 2008 to August 2011

It has long been acknowledged that genetic progress in beef cattle is slow due to long generation intervals and, in many cases, low selection intensity on traits of economic importance. However, genetic progress is cumulative and can be maintained at modest annual costs. The TBTS project has assisted many seedstock herds, and animals within those herds, to be involved in Australia's national genetic evaluation program, BREEDPLAN

TBTS has played an important role in extending a range of messages relating to beef genetics and selection to the northern beef industry. Technical support and communication activities over the term of the project included a biannual SBTS & TBTS Update newsletter, two webinar courses involving over 1000 seedstock producers across Australia, 20 workshops/field days with an estimated audience of 601 producers and 51 on property consultations with seedstock herds in northern Australia.

The TBTS project has contributed to there being a significant number of animals within seedstock herds, and bulls available to commercial industry, having accurately described genetics. This is through published BREEDPLAN EBVs for a range of traits and Selection Indexes. While the number of BREEDPLAN herds and percentage of animals with at least one post-birth weight recorded for genetic analysis purposes has plateaued, the percentage of animals being recorded for other traits of economic importance such as fertility, carcase and temperament has significantly increased.

The number of herds submitting joining records for the female fertility analysis (Days to Calving) has doubled from 15 to 30, the percentage of calves with a 200 day weight recorded that also have a scrotal circumference and/or live animal ultrasound scan for carcase traits increased to 46% (males only) and 24% respectively. There is regular collection and submission of flight time records as an indicator of temperament and tenderness for 3 breeds, and the number of breeds with at least one Selection Index published has increased from 2 to 4.

Combining the Selection Index genetic trends of Brahman and Santa Gertrudis provides an estimate of the overall average rate of genetic progress (in \$ terms) currently being made in the Northern Beef industry. Using this combining method, the average rate of genetic progress has increased by 66% when comparing the 2001 to 2005 calving years with the 2005 to 2009 calving years. That is, \$0.67/per cow mated/year between the 2001 to 2005 calving years compared to \$1.11/per cow mated/year between the 2005 to 2009 calving years.

The improvement in profitability via genetics is most effectively estimated using the combined Brahman and Santa Gertrudis Selection Index trends. The net dollar (\$) gain to the northern beef industry via Brahman and Santa Gertrudis genetic improvement (over the term of this project) is conservatively estimated to be \$4.5 million per year.

All TBTS stakeholders, including the MLA, recently committed to a 4 year extension of the TBTS project.

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# 1 Background

Tropical Beef Technology Services (TBTS) is a joint initiative between Meat and Livestock Australia (MLA), the Agricultural Business Research Institute (ABRI) and nine tropical Breed Association which include the Australian Brahman Breeders Association (ABBA), Santa Gertrudis Breeders (Australia) Association (SGBAA), Droughtmaster Stud Breeders Society (DSBS), Australian Braford Society (ABS), Belmont Australia (BA), Australian Brangus Cattle Association (ABCA), Australian Charbray Societies (ACS), Australian Senepol Cattle Breeders Association (ASCBA) and Simbrah Society of Australia (SSA).

The TBTS project began in August 1997 after it was recognised that the level of BREEDPLAN performance recording in tropical seedstock herds was at a far lower rate compared to their British and European breed counterparts in the south.

The first term of the TBTS project ran from August 1998 to August 2002 under the guidance of Richard Apps with all milestones achieved ahead of schedule. The second term ran from August 2002 to June 2005, again with outstanding outcomes relating to the project milestones. In August 2002 Christian Duff replaced Richard Apps as Technical Officer. The third term ran from June 2005 to August 2008. Craig Croker replaced Christian Duff as Technical Officer in October 2006. The fourth term, which is outlined in this report, ran from July 2008 to August 2011. Philip Mann replaced Craig Croker as Technical officer in September 2008.

Traditionally MLA has allocated funds to this project through the Northern Beef Program (NBP) research and development grants. The fourth term of this project was different with co-funding allocated on a \$ for \$ basis through the MLA Donor Company scheme.

The TBTS project is currently in its 14<sup>th</sup> year of operation with all stakeholders, including the MLA, recently committing to a 4 year extension.

## 2 Project Objectives

By August 31<sup>st</sup> 2011, the project will:

1. Increase participation in performance recording for genetic evaluation with BREEDPLAN.
  - a) Increase number of performance recording herds indicated by BREEDPLAN membership from 246 in August 2007 (base year) to 270 in August 2011.
  - b) Increase the percentage of calves recorded for at least one post birth performance record from 45% in the 2005 drop calves (base year) to 55% in the 2009 drop calves.
2. Increase the number of herds and/or animals recorded for traits other than post birth weights that are economically important in Northern Australia
  - a) Fertility:
    - i. Double the number of herds that are recording joining details for the whole herd to enable the generation of Days to Calving EBVs from 15 in 05/06 joining (base year) to 30 in 09/10 joining.
    - ii. Increase the number of Tropical cattle breeds with a days to calving analyses from 2 to 4.

- iii. Increase the percentage of 200 day weight recorded males with a Scrotal circumference recorded for genetic evaluation from 43% in the 2005 drop males (base year) to 53% in the 2009 drop males.
  - b) Temperament and Flight time:
    - i. Facilitate the analysis and publishing of Flight time and/or Docility EBVs for at least 1 Northern cattle breed.
    - ii. Initiate Flight time and/or Docility score recording on the pedigree and performance databases of 3 tropical breeds including the SGB(A)A.
  - c) Carcase: Increase the percentage of 200 day weight recorded animals with live animal ultrasound scan data for EMA and fat measurements recorded for genetic evaluation through BREEDPLAN from 18% in 2005 drop calves (base year) to 25% in the 2009 drop.
  - b) Facilitate the recording of pedigree and performance data collected in the Beef CRC project to the relevant tropical breeds' pedigree and performance database for incorporation in the animal GROUP BREEDPLAN analysis.
3. Increase the number of Tropical Cattle Breed Societies with Selection Indexes published from 2 to 4.
  4. Increase the average BreedObject Selection Index value for the Brahman and Santa Gertrudis breeds by 25% between 2005 drop (base year) and 2009 drop calves.
  5. Undertake extension activities and provide technical support to implement existing and new BREEDPLAN related technologies in tropical breed Seedstock herds (e.g. Internet solutions, BreedObject, TakeStock, Data Quality Herd audit, Smart Gene for Beef – Marker assisted EBVs).
  6. Recommend a strategy for the continuation and funding of the services provided by TBTS beyond this project.

### **3 Success in Achieving Objectives**

#### **3.1 Increase participation in performance recording for genetic evaluation with BREEDPLAN.**

##### **3.1.1 Increase number of performance recording herds indicated by BREEDPLAN membership from 246 in August 2007 (base year) to 270 in August 2011.**

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Table 1 indicates an overall decrease in the number of herds performance recording with BREEDPLAN since August 2007 from 246 to 236 members and represents an overall reduction in BREEDPLAN herds of 4%. The change in the number of herds recording with BREEDPLAN on a breed basis shows an overall increase in Droughtmaster and Brangus herds but a decrease in Brahman, Santa Gertrudis, Belmont Red and Braford. The decrease has been offset to a degree by the inclusion of Senepol and Charbray herds into BREEDPLAN and the TBTS project in 2009.

**Table 1:** BREEDPLAN members per breed

| Breed           | BP Members Aug-07 | BP Members July-11 | Change +/- |
|-----------------|-------------------|--------------------|------------|
| Brahman         | 100               | 91                 | -9         |
| Santa Gertrudis | 71                | 53                 | -18        |
| Droughtmaster   | 28                | 30                 | +2         |
| Brangus         | 20                | 22                 | +2         |
| Belmont Red     | 14                | 13                 | -1         |
| Braford         | 13                | 6                  | -7         |
| Charbray        | 0                 | 9                  | +9         |
| Senepol         | n/a               | 12                 | +12        |
| <b>TOTAL</b>    | <b>246</b>        | <b>236</b>         | <b>-10</b> |

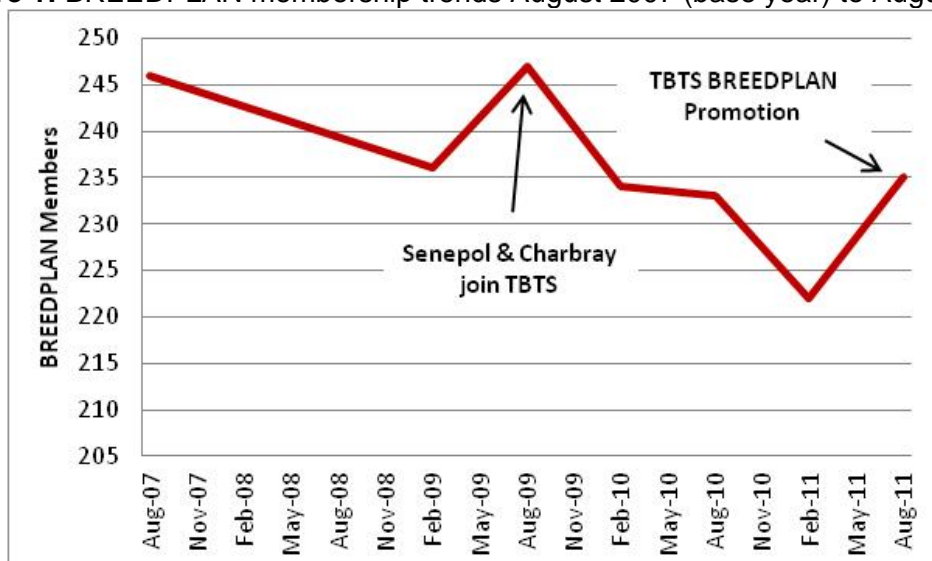
TBTS has actively corresponded with the majority of herds that resigned from BREEDPLAN in recent times. The reasons for resignation were varied and include:

- a) stud dispersal,
- b) inability of owners to continue with requirements of performance recording due to old age and deteriorating health,
- c) owners wanting to minimise the input costs of the enterprise
- d) forced termination of membership as a result of non-payment of accounts,
- e) bull buying clients not requesting the genetic information that producers are providing on their cattle.

Apart from the entry of Senepol and Charbray into the TBTS project, there has been a gradual decline in BREEDPLAN membership since the August 2007 base year statistic up to and including the February 2011 reporting period (Figure 1).

There is little doubt that the period covered by this phase of the TBTS project was also characterised by some of the worst times financially for producers with the impact of the global financial crisis, severe drought, record floods and a major disruption in the live export trade to Indonesia all happening in relatively quick succession. The financial burden imposed on producers by these events will have had, and continue to have, a significant influence on their decision to continue, or to start, performance recording for genetic evaluation.

**Figure 1:** BREEDPLAN membership trends August 2007 (base year) to August 2011.





In an effort to encourage enrolment of new BREEDPLAN members, TBTS, with the generosity of ABRI, developed a promotional strategy that was communicated with select non-BREEDPLAN herds that were members of a TBTS Breed Society. Apart from highlighting the benefits of genetic evaluation of their herd through BREEDPLAN, the promotion offered one year free BREEDPLAN membership (valued at \$132 inc. GST) if they joined prior to the end of July 2011.

The response to this promotion was encouraging with a total of 20 herds (refer table 2 for breakup by breed) taking advantage of the offer which resulted in a net increase in BREEDPLAN membership, following the February 2011 reporting period, of 14 herds or 6%.

**Table 2:** Breed breakup of new members enrolling in BREEDPLAN following TBTS promotion

| <b>Breed</b>    | <b>Number of herds enrolling</b> |
|-----------------|----------------------------------|
| Brahman         | 9                                |
| Santa Gertrudis | 3                                |
| Droughtmaster   | 2                                |
| Charbray        | 6                                |
| <b>TOTAL</b>    | <b>20</b>                        |

While overall BREEDPLAN membership has decreased marginally during the current period of the TBTS project, the more important concept to focus on moving forward is to ensure those herds that are having the biggest influence within the seedstock sector are performance recording, optimising their use of the available genetic technologies and increasing the rates of genetic progress being achieved in their herd. This in turn will drive the genetic progress made for the economically important traits within each breed and flow through to the northern beef industry. This will form the main direction of the next phase of the TBTS project.

### **3.1.2 Increase the percentage of calves recorded for at least one post birth performance record from 45% in the 2005 drop calves (base year) to 55% in the 2009 drop calves.**

With the overall 4% reduction in BREEDPLAN membership, there has been a corresponding decrease (8.5%) in the overall number of calves recorded through BREEDPLAN for at least one post-birth performance record as a proportion of calves recorded on the respective Societies database (Table 3).

**Table 3:** BREEDPLAN recorded calves expressed as a % of calves recorded with the respective Breed Societies.

| <b>Breed</b>    | <b>% 2005 Calving Year</b> | <b>% 2009 Calving Year</b> | <b>Change +/-</b> |
|-----------------|----------------------------|----------------------------|-------------------|
| Brahman         | 47.1%                      | 41.6%                      | -5.5%             |
| Santa Gertrudis | 55.4%                      | 42.8%                      | -12.6%            |
| Droughtmaster   | 24.6%                      | 20.2%                      | -4.4%             |
| Brangus         | 35.9%                      | 36.9%                      | +1.0%             |
| Belmont Red     | 98.2%                      | 78.7%                      | -19.5%            |
| Braford         | 35.9%                      | 22.9%                      | -13.0%            |
| Charbray        | 0%                         | 13.7%                      | +13.7%            |
| Senepol         | 0%                         | 39.9%                      | +39.9%            |
| <b>TOTAL</b>    | <b>45%</b>                 | <b>36.5%</b>               | <b>-8.5%</b>      |

Using the comparison from table 3 it is evident that, of the breeds that were in BREEDPLAN at the collection of base year statistics, Brangus have marginally increased the proportion of calves recorded with BREEDPLAN while the remainder have declined. The Belmont Red, Braford and more recently, Santa Gertrudis breeds have experienced the most significant reductions in the proportion of performance recorded calves. This is a reflection of the reductions in BREEDPLAN membership within these breeds.

Although there has been a recent increase in the BREEDPLAN membership as an outcome of the TBTS promotion, there will be a lag phase before the benefit of this in terms of an increase in the proportion of performance recorded animals will be realised.

### **3.2 Increase the number of herds and/or animals recorded for traits other than post birth weights that are economically important in Northern Australia**

#### **3.2.1 Fertility: Double the number of herds that are recording joining details for the whole herd to enable the generation of Days to Calving EBVs from 15 in 05/06 joining (base year) to 30 in 09/10 joining.**

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There has been an overall increase of fifteen (15) herds recording joining details for the generation of Days to Calving EBVs (table 4). As such, the project objective to double the number of herds that are recording joining details for the whole herd has been achieved.

Looking at each breed independently, there has either been an increase, or no change, in the number of herds recording this trait since collection of base year statistics. With further confirmation of the importance of this trait for the genetic improvement of fertility from research conducted by the Beef CRC, TBTS has actively promoted the recording and submission of joining records by BREEDPLAN members. While good progress has been made, there is significant scope to further increase the number of herds recording and submitting data for this important trait.

During the current phase of the project, there have been significant changes made to the collection and storage of female reproduction information on the Society performance and pedigree databases for use in the current Days to Calving analysis and for future research purposes. This has added a layer of complexity that has had to be conveyed to breeders interested in recording this trait.

TBTS will continue emphasis on this important trait to promote further uptake in the next phase of the project.

**Table 4:** Number of BREEDPLAN herds recording joining details for Days to Calving.

| Breed           | Herds - 05/06 Joinings | Herds - 09/10 Joinings | Change +/- |
|-----------------|------------------------|------------------------|------------|
| Brahman         | 4                      | 11                     | +7         |
| Santa Gertrudis | 8                      | 9                      | +1         |
| Droughtmaster   | 0                      | 4                      | +4         |
| Brangus         | 0                      | 0                      | 0          |
| Belmont Red     | 3                      | 6                      | +3         |
| Braford         | 0                      | 0                      | 0          |
| Charbray        | 0                      | 0                      | 0          |
| Simbrah         | n/a                    | n/a                    | n/a        |
| Senepol         | 0                      | 0                      | 0          |
| <b>TOTAL</b>    | <b>15</b>              | <b>30</b>              | <b>+15</b> |

### **3.2.2 Fertility: Increase the number of tropical cattle breeds with a days to calving analyses from 2 to 4**

The number of tropical cattle breeds with Days to Calving EBV analyses as part of their GROUP BREEDPLAN analysis remains unchanged at 2 being Brahman and Santa Gertrudis.

At TBTS's request, the Animal Genetics and Breeding Unit (AGBU) conducted a trial Days to Calving analysis for Belmont Australia (BA) using an extract of the joining records on the BA database in March, 2011. Following this analysis, it was agreed to release trial Days to Calving EBVs on sires with an EBV accuracy of greater than 65% to BA members to assist with their selection. This represents a major step forward in achieving a Days to Calving analysis for BA in their annual GROUP BREEDPLAN analysis. It is envisaged that with the addition of further joining records over the next 12 month period, Days to Calving will be included in the BA GROUP analysis in 2012.

Additionally, with four of the larger Droughtmaster herds now recording joining information for addition to the Droughtmaster database, and others indicating their intention to do so, it is expected that a genetic evaluation for Days to Calving will also be available for this breed in the near future

### **3.2.3 Fertility: Increase the percentage of 200 day weight recorded males with a Scrotal circumference recorded for genetic evaluation from 43% in the 2005 drop males (base year) to 53% in the 2009 drop males.**

Table 5 shows the comparison by breed for the percentage of 200 day weight BREEDPLAN recorded males that have a scrotal circumference recorded for genetic evaluation. While falling short of this project objective, there has been an overall increase of 3% across the listed breeds. With the exception of Santa Gertrudis and Braford, all breeds have achieved increases in the proportion of scrotal measurements added to the database for genetic evaluation.

**Table 5:** % 200 day weight recorded males with scrotal circumference measurement

| Breed*          | % 2005 Calving Year | % 2009 Calving Year | Change +/-  |
|-----------------|---------------------|---------------------|-------------|
| Brahman         | 26%                 | 33%                 | + 7%        |
| Santa Gertrudis | 69%                 | 64%                 | - 5%        |
| Droughtmaster   | 35%                 | 40%                 | + 5%        |
| Brangus         | 32%                 | 48%                 | +16%        |
| Belmont Red     | 30%                 | 54%                 | + 24%       |
| Braford         | 13%                 | 3%                  | -10%        |
| <b>TOTAL</b>    | <b>43%</b>          | <b>46%</b>          | <b>+ 3%</b> |

\* The breeds listed undertake regular GROUP BREEDPLAN analyses. Those breeds that currently undertake within-herd BREEDPLAN analyses are not listed (i.e. Senepol and Charbray)

### 3.2.4 **Temperament and Flight time: Facilitate the analysis and publishing of Flight time and/or Docility EBVs for at least 1 Northern cattle breed.**

The project objective for facilitating the analysis and publishing of a trial Flight Time EBV for at least one tropical breed has been achieved with the release of a trial Flight Time EBV for Brahman in October 2008. This was released in conjunction with the trial Marker Assisted EBV for Shear Force (tenderness) in the Brahman breed.

Additionally, the Santa Gertrudis breed has made good progress in terms of the numbers of Flight time records collected and added to the database for future genetic evaluation (table 6). Two reviews of the data by AGBU revealed a lack of adequate genetic linkage between the herds for this trait. This is currently preventing the progression to generate Flight Time EBVs from the monthly Santa Gertrudis GROUP BREEDPLAN analyses.

**Table 6:** Flight time records recorded on the performance and pedigree databases for the Brahman, Santa Gertrudis and Belmont Red breeds.

| Calving Year | Brahman     | Santa Gertrudis | Belmont Red |
|--------------|-------------|-----------------|-------------|
| 2005         | 529         | 1540            | 238         |
| 2006         | 600         | 1928            | 275         |
| 2007         | 679         | 1853            | 305         |
| 2008         | 705         | 1694            | 329         |
| 2009         | 1019        | 1537            | 416         |
| 2010         | 728         | 1323            | 301         |
| <b>TOTAL</b> | <b>4260</b> | <b>9875</b>     | <b>1864</b> |

### 3.2.5 **Temperament and Flight time: Initiate Flight time and/or docility score recording on the pedigree and performance databases of 3 tropical breeds including the SGB(A)A.**

TBTS has been active in encouraging tropical breed seedstock herds to record flight time measurements on their weaner or yearling calves. This has included general promotion of the benefits of this trait and the organisation and distribution of flight time units. It was decided to focus on the collection of flight time due to the genetic relationships with temperament and meat tenderness as identified in Beef CRC research.

The outcome being, flight time records have been recorded on the pedigree and performance databases of Brahman, Santa Gertrudis and Belmont Red (table 6). This objective has therefore been achieved.

**3.2.6 Carcase: Increase the percentage of 200 day weight recorded animals with live animal ultrasound scan data for EMA and fat measurements recorded for genetic evaluation through BREEDPLAN from 18% in 2005 drop calves (base year) to 25% in the 2009 drop.**

There has been an overall increase of 6% from 18% (2005 calving year) to 24% (2009 calving year) of animals with a 200 day weight recorded that also have a live animal carcass scan measurements recorded for genetic evaluation. This is marginally (1%) below the project objective. Table 7 shows the comparison by breed for the number of calves recorded with BREEDPLAN for a live animal ultrasound scan measurement for carcass traits between the 2005 (base year) and 2009 calf drop expressed as a percentage of the total number of calves recorded with a 200 day weight on the society database for these years.

Substantial increases in the recording of live animal ultrasound scan measurements have occurred in the majority of breeds. This is specifically apparent for the Santa Gertrudis, Droughtmaster, Brangus and Belmont Red breeds.

**Table 7:** Percent 200 day weight recorded calves with live animal ultrasound scan measurements

| <b>Breed*</b>   | <b>% 2005 Calving Year</b> | <b>% 2009 Calving Year</b> | <b>Change +/-</b> |
|-----------------|----------------------------|----------------------------|-------------------|
| Brahman         | 4%                         | 3%                         | -1%               |
| Santa Gertrudis | 40%                        | 48%                        | + 8%              |
| Droughtmaster   | 8%                         | 23%                        | + 15%             |
| Brangus         | 6%                         | 43%                        | + 37%             |
| Belmont Red     | 9%                         | 25%                        | + 16%             |
| Braford         | 0%                         | 0%                         | 0%                |
| <b>TOTAL</b>    | <b>18%</b>                 | <b>24%</b>                 | <b>+6%</b>        |

\* The breeds listed undertake regular GROUP BREEDPLAN analyses. Those breeds that currently undertake within-herd BREEDPLAN analyses are not listed (i.e. Senepol and Charbray)

**3.2.7 Facilitate the recording of pedigree and performance data collected in the Beef CRC project to the relevant tropical breeds' pedigree and performance database for incorporation in the animal GROUP BREEDPLAN analysis.**

Facilitating the recording of pedigree and performance data on the associated breed's database from the Beef CRC research herds was undertaken in each year of this project. The research herds included Swans Lagoon, Belmont and Toorak.

Table 8 details the performance records that were added to the database in each calendar year from 2009 to 2011 from CRC herds. This performance data was included in the associated GROUP BREEDPLAN analyses for both Brahman and Belmont Red. This has significantly increased the levels of EBV accuracy being generated from the BREEDPLAN analyses of each breed

**Table 8:** Performance records added to the Brahman or Belmont Red database for genetic evaluation from CRC herds from 2009 to 2011

| Year         | Breed              | Weights*    | Scans†     | Mature Cow Weights | Traits‡     | Joining Records |
|--------------|--------------------|-------------|------------|--------------------|-------------|-----------------|
| 2009         | Brahman            | 1297        | 279        | 407                | 1216        | 831             |
|              | Belmont Red        | 1059        | 275        | 275                | 242         | 0               |
| 2010         | Brahman            | 702         | 205        | 619                | 652         | 813             |
|              | Belmont Red        | 357         | 33         | 106                | 235         | 0               |
| 2011         | Brahman            | 339         | 0          | 351                | 1697        | 0               |
|              | Belmont Red        | 197         | 0          | 48                 | 809         | 0               |
| <b>Total</b> | <b>Brahman</b>     | <b>2338</b> | <b>484</b> | <b>1377</b>        | <b>3565</b> | <b>1644</b>     |
|              | <b>Belmont Red</b> | <b>1613</b> | <b>308</b> | <b>429</b>         | <b>1286</b> | <b>0</b>        |

\* Weights include birth, 200, 400 and 600 day weights

† Live animal ultrasound scans for carcass traits including eye muscle area, rib fat, rump fat and intramuscular fat.

‡ Traits include flight time and scrotal circumference.

### 3.3 Increase the number of Tropical Cattle Breed Societies with Selection Indexes published from 2 to 4.

There are currently 3 Tropical breeds with Selection Indexes published and 1 close to publishing being:

- Brahman - Jap Ox Index
- Santa Gertrudis - Domestic Production Index and Export Production Index.
- Belmont Red- Domestic Steer Index and Export Steer Index.
- Brangus - Domestic and Export

Two Selection Indexes (Domestic Index and Export Index) have recently been developed in consultation with the Australian Brangus Cattle Societies Technical Committee. They will be publically released and published in the lead up to the 35<sup>th</sup> Australian Brangus Cattle Society bull sale being held in Rockhampton on October 11<sup>th</sup> 2011.

TBTS has also played a key facilitating role in the development of a Live Export Index for Brahman. The development of this Index was funded through MLA and led by the Northern Territory DPI. It is expected that this Index will be published in late 2011.

With the release of the Brangus Selection Indexes, 4 tropical cattle breed Societies now have at least one Selection Index published, being Brahman, Santa Gertrudis, Belmont Red and Brangus. This objective has therefore been achieved.

### 3.4 Increase the average BreedObject Selection Index value for the Brahman and Santa Gertrudis breeds by 25% between 2005 drop (base year) and 2009 drop calves.

The average Selection Index value (i.e. genetic value in \$ terms for a specific production system) has increased for the Brahman and Santa Gertrudis Selection Indexes comparing the 2005 to 2009 calving years (table 9).

**Table 9:** % Change in Average Selection Index Value

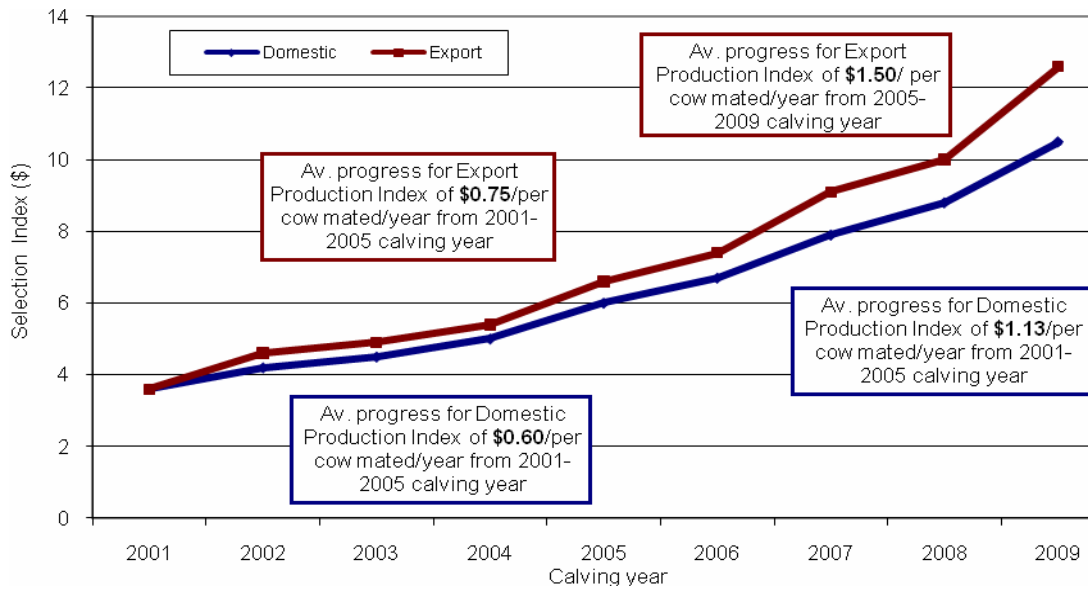
| Breed           | Index               | Av. Selection Index 2005 Calving Year (\$) | Av. Selection Index 2009 Calving Year (\$) | Change +/- (%) |
|-----------------|---------------------|--|--|----------------|
| Santa Gertrudis | Domestic Production | 6.1  | 10.5                                       | + 72%          |
| Santa Gertrudis | Export Production   | 6.3  | 12.6                                       | + 100%         |
| Brahman         | Jap Ox              | 17.2                                       | 19.6                                       | + 14%          |

The two Santa Gertrudis Selection Indexes, Domestic Production and Export Production, are well in excess of achieving the project objective of a 25% increase being 72% and 100% respectively. This is partially a function of their low base values which were not known when the project objectives were developed.

Additionally, despite the low base values, Figure 2 clearly illustrates that substantial increases in the averages for both Santa Gertrudis Selection Indexes have been achieved in more recent years with an average rate of genetic progress of \$1.50/per cow mated/year and \$1.13/per cow mated/year for the 2005 to 2009 calving year for the Export Production and Domestic Production Indexes respectively. Compared with an average rate of progress of \$0.75/per cow mated/year and \$0.60/per cow mated/year for the Export and Domestic Indexes respectively, over the 2001 to 2005 calving year.

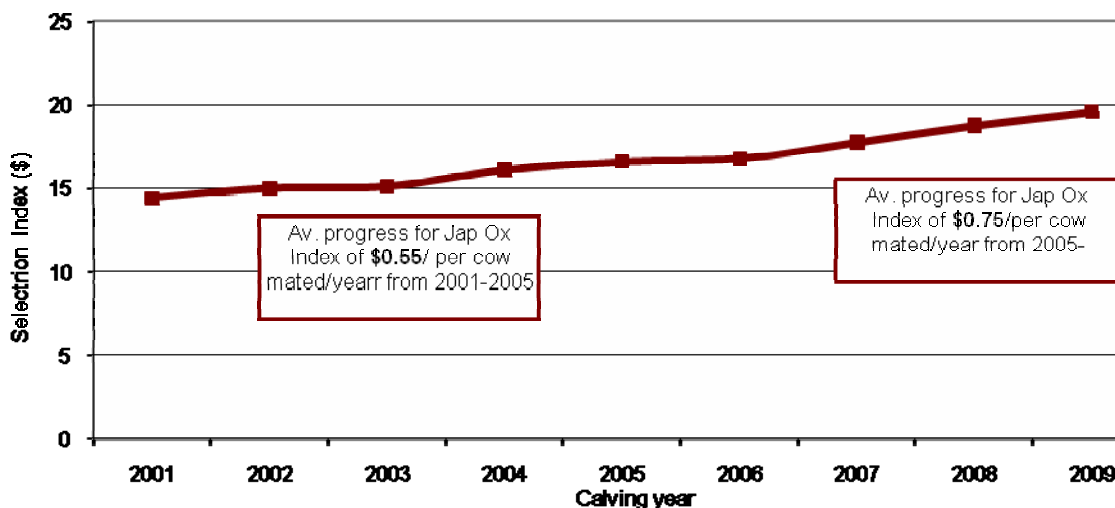
Increases in the average rate of genetic progress (in \$ terms) by comparing the two periods represents a 100% and 88% increase for the Santa Gertrudis Export Production and Domestic Production Selection Indexes, respectively.

**Figure 2: Santa Gertrudis Selection Index (Domestic Production and Export Production) genetic trends for 2001 to 2009 calving year.**



The average Brahman Jap Ox Selection Index has increased by 14% (table 9) which is marginally below the objective of 25%. However, when the average genetic progress in the Jap Ox Index for the 2001-2005 and 2005-2009 calving years are compared, there has been an increase in the rate of genetic progress (in \$ terms) of 36%. That is, \$0.55/per cow mated/year for the 2001 to 2005 calving year compared to \$0.75/per cow mated/year for the 2005 to 2009 calving year (Figure 3).

**Figure 3: Brahman Jap Ox Selection Index genetic trends for 2001 to 2009 calving year.**



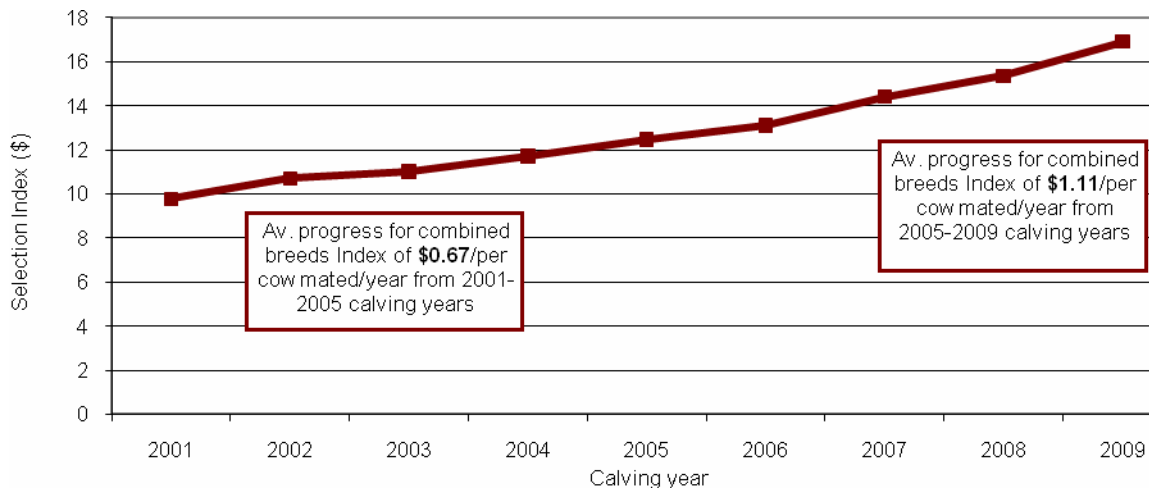
Combining the Selection Index genetic trends of Brahman and Santa Gertrudis provides an estimate of the overall average rate of genetic progress (in \$ terms) currently being made in the Northern Beef industry. The combined Brahman and Santa Gertrudis Index (Figure 5) shows the weighted average genetic trend using their Export Selection Index values for the



calving year 2001 through to 2009. The average rate of genetic progress across the two breeds over this period has been \$0.89/per cow mated/year.

The weighting is based on the number of animals in each breed with a selection Index generated. For example, in the 2009 calving year Brahman had 13,394 animals with a Selection Index generated compared to 7,748 Santa Gertrudis. The weighting for this calving year was therefore 63.4% on the Brahman Jap Ox Index and 36.6% on the Santa Gertrudis Export Production Index.

**Figure 4:** Combined Selection Index genetic trends for the Brahman and Santa Gertrudis from 2001 to 2009 calving years.



Using this combining method, the average rate of genetic progress has increased by 66% when comparing the 2001 to 2005 calving years with the 2005 to 2009 calving years. That is, \$0.67/per cow mated/year in 2001 to 2005 calving years compared to \$1.11/per cow mated/year in 2005 to 2009 calving years.

Using this combined approach, the increase in average Selection Index, based on the Export Indexes of Brahman and Santa Gertrudis, has increased by 36% from the 2005 base year. That is, the average weighted Selection Index value of \$12.50 in the 2005 calving year compared to the average weighted Selection Index of \$16.90 in the 2009 calving year. This objective has therefore been achieved.

**3.5 Undertake extension activities and provide technical support to implement existing and new BREEDPLAN related technologies in tropical breed Seedstock herds (e.g. Internet solutions, BreedObject, TakeStock, Data Quality Herd audit, Smart Gene for Beef – Marker assisted EBVs).**

A broad range of extension and technical support activities have been undertaken by TBTS to facilitate the implementation of new and existing BREEDPLAN related technologies in tropical breed seedstock herds. To efficiently use the available resources, many activities were undertaken in conjunction with the Southern Beef Technology Services (SBTS). These activities included:

3.5.1 On-property consultations: 51 on-property consultations with seedstock herds have been undertaken by TBTS Technical officers to promote uptake of performance recording through BREEDPLAN and encourage existing BREEDPLAN members to record additional traits to the weight traits.

The recent development of the 'Pedigree and Performance Submission Summary report through the SBTS/TBTS network resulted in a significant enhancement to on-property consultations. This report provided a concise, well presented document that details the performance trait recording history of a herd and highlights potential areas for improvement. Through this report, the recording history for the full set of BREEDPLAN traits are listed and graphed including the broad areas of animal details, weight traits, carcass traits, birth & fertility traits and "other" traits such as docility, flight time, structural soundness, DNA for performance traits and net feed intake.

3.5.2 Webinars: Two webinar courses, in conjunction with SBTS, have been successfully held in 2010 and 2011.

During June and July 2010, SBTS and TBTS jointly facilitated the first webinar course titled "*BREEDPLAN – From Go to Whoa!*". This webinar course aimed to both inform and up skill members of participating Breed Societies in performance recording for BREEDPLAN. Topics ranged from basic subjects such as why record with BREEDPLAN to more technical complex topics such as how DNA information will be incorporated into the BREEDPLAN analysis.

A webinar covering a specific topic was held each Monday night for a 6 week period with the duration of each being around 45 minutes. This included a presentation on the topic and periodic question and answer sessions throughout. Following is a list of each webinar and the attendance numbers (table 10).

**Table 10:** "*BREEDPLAN – From Go to Whoa!*" attendance statistics

| <b>Date</b> | <b>Topic</b>   | <b>Attendance</b> |
|-------------|--|-------------------|
| 21/6/2010   | Performance Recording with BREEDPLAN                   | 130               |
| 28/06/2010  | Understanding the Birth Traits                         | 121               |
| 5/7/2010    | Understanding the Weight Traits                        | 92                |
| 12/7/2010   | Understanding the Carcass Traits                       | 84                |
| 19/7/2010   | Understanding the Fertility Traits & Docility          | 87                |
| 26/7/2010   | The Newer EBVs and incorporation of DNA into BREEDPLAN | 71                |
|             | <b>Total</b>   | <b>585</b>        |
|             | <b>Unique Attendees</b>                                | <b>232</b>        |

This attendance can be further broken down as follows:

- 96% seedstock producers, 4% industry representatives/commercial producers
- Of seedstock producers, 66% BREEDPLAN members, 34% Non-BREEDPLAN members
- Participants from 7 of 9 Breed Societies participating in TBTS.
- Participants from 59 seedstock herds that were members of TBTS breed societies.
- There were 232 individual seedstock operations who attended at least one webinar (ie. unique attendees). This showed that many repeated multiple webinars.

The second SBTS & TBTS webinar course titled “*Know Your Genes: An update on DNA Technology for the Seedstock Producer*” was held during June to July 2011. This webinar course also involved input from Beef CRC Scientists. This webinar course aimed to update seedstock producers on the current state of play with DNA technology across a broad range of applications.

As with the previous webinar course, a webinar covering a specific topic was held each Monday night for a 6 week period with the duration of each being around 45 minutes. This included a presentation on the topic and periodic question and answer sessions throughout. Following is a list of each webinar and the attendance numbers (table 11).

**Table 11:** “*Know Your Genes: An update on DNA Technology for the Seedstock Producer*” attendance statistics.

| <b>Date</b>             | <b>Topic</b>                                 | <b>Attendance</b> |
|-------------------------|--|-------------------|
| 20/6/2011               | DNA Technology - Understanding the Basics    | 114               |
| 27/6/2011               | Utilising DNA for Parentage Verification     | 93                |
| 4/7/2011                | Managing Genetic Conditions with DNA         | 74                |
| 11/7/2011               | Utilising DNA to Change Type Traits          | 91                |
| 18/7/2011               | Improving Production Traits with DNA         | 68                |
| 25/7/2011               | Assessing the Cost-Benefit of DNA Technology | 66                |
| <b>Total</b>            |  | <b>506</b>        |
| <b>Unique Attendees</b> |  | <b>223</b>        |

This attendance can be further broken down as follows:

- 89% seedstock producers, 11% industry representatives/commercial producers
- Of seedstock producers, 66% BREEDPLAN members, 34% Non-BREEDPLAN members
- Participants from 7 of 9 Breed Societies participating in TBTS.
- Participants from 72 seedstock herds that were members of TBTS Breed Societies.
- There were 232 individual seedstock operations who attended at least one webinar (ie. unique attendees). This showed that many repeated multiple webinars.

At the completion of each webinar the attendees were polled to gauge the effectiveness of the information presented. 94% of respondents agreed or strongly agreed that they were better informed to make decisions about the application of DNA technology in their herd (Appendix 1).

Additionally, once completed each webinar was uploaded and made available for viewing from the webinars page of the SBTS and TBTS websites. At the time of writing this report, sessions from the “*Know Your Genes*” webinar course had been viewed 467 times.

Additional webinar attendance statistics are listed in Appendix 2.

**3.5.3 Field Days and Workshops:** TBTS has been involved in a range of field days and workshops covering topics on BREEDPLAN and related technologies (table12). Many of the workshops have been organised and fully facilitated by TBTS. Others are field days which TBTS has been invited to present one session amongst a range of presenters and topics.

During the 3 year term of this project TBTS presented on BREEDPLAN and related technologies at 20 events of which 11 were organised and facilitated by TBTS. These activities attracted 601 attendees averaging 30 per event.

**Table 12: Field days and workshops involving TBTS**

| <b>Date</b> | <b>Activity</b>                   | <b>Organisation/Location</b>             | <b>Attendance</b> |
|-------------|-----------------------------------|--|-------------------|
| 14/08/2008  | "Closer to Your Clients" Workshop | Gyranda Santa Gertrudis, Theodore QLD    | 110               |
| 15/08/2008  | "Closer to Your Clients" Workshop | Wightfields Santa Gertrudis, Wandoan QLD | 31                |
| 28/06/2009  | Bos indicus Advatage Field Day    | Santa Gertrudis, Drummond, VIC           | 50                |
| 08/07/2009  | "Know Your Genes" Workshop        | TBTS/SBTS, Casino, NSW                   | 14                |
| 09/07/2009  | "Know Your Genes" Workshop        | TBTS/SBTS, Toowoomba, QLD                | 59                |
| 10/07/2009  | "Know Your Genes" Workshop        | TBTS/SBTS, Gympie, QLD                   | 26                |
| 13/07/2009  | "Know Your Genes" Workshop        | TBTS/SBTS, Rockhampton, QLD              | 25                |
| 15/07/2009  | "Know Your Genes" Workshop        | TBTS/SBTS, Longreach, QLD                | 20                |
| 19/07/2009  | Cattle Assessment School          | Droughtmaster, Nanango, QLD              | 25                |
| 24/07/2009  | Cattle Breeding Field Day         | Lisgar Droughtmaster, Ayr, QLD           | 15                |
| 25/02/2010  | AAC Students Workshop             | AAC, Munduberra, QLD                     | 13                |
| 12/03/2010  | BREEDPLAN Workshop                | Santa Gertrudis, Armidale, NSW           | 18                |
| 09/05/2010  | Cattle Assessment School          | Droughtmaster, Gympie, QLD               | 30                |
| 19/06/2010  | Cattle Breeding Field Day         | Brangus, Eidsvold, QLD                   | 13                |
| 06/07/2010  | Cattle Assessment School          | Santa Gertrudis, Rockhampton, QLD        | 32                |
| 11/07/2010  | Cattle Assessment School          | Droughtmaster, Nanango, QLD              | 16                |
| 24/08/2010  | "Closer to Your Clients" Workshop | Tremere Belmonts, Moura, QLD             | 28                |
| 04/09/2010  | Cattle Breeding Field Day         | Senepol, Nobby, QLD                      | 21                |
| 08/11/2010  | Genetic Progress Workshop         | TBTS, Brisbane, QLD                      | 20                |
| 14/04/2011  | BREEDPLAN Workshop                | TBTS, Rockhampton, QLD                   | 35                |
|             | <b>Total</b>                      |  | <b>601</b>        |
|             | <b>Average</b>                    |  | <b>30</b>         |

Workshops to note include:

- "*Know Your Genes*" workshop series: A total of 19 DNA technology workshops titled "*Know your Genes*" were conducted across Australia by SBTS and TBTS in, 2009. A total of 344 seedstock producers attended a workshop in this series. This included 110 seedstock producers from the TBTS Breed Societies. Information presented at these workshops communicated the SmartGene for Beef results and focused on providing seedstock producers with an 'all you need to know' guide required to make informed decisions about using the DNA technology that is available now and in the future.

Participants were surveyed at the beginning and end of the workshop to determine learning outcomes. The survey consisted of 5 self appraisal questions and 15 True/False questions related to their knowledge of DNA technology and its application. Overall, results from the survey showed the level of understanding of DNA technology increased by 80% based on the True/False questionnaire and by 65% based on their own self appraisal following information provided to them during the workshop.

- "Closer to Your Client" Workshops: These are aimed at providing commercial producers with a better understanding of the genetic information available to enable more informed bull purchasing decisions. The workshop series also provided the opportunity for seedstock producers to create a closer relationship with their commercial clients by hosting a workshop on their property. This one day workshop is hosted by the seedstock herd and fully facilitated by the TBTS team. Three "Closer to Your Clients" workshops were conducted over the term of this project.
- Tropical Breeds BREEDPLAN Information Workshop: This initiative was held in Rockhampton on the 14th of April, 2011. This workshop followed a similar format to that conducted for the Santa Gertrudis breed in 2010 in Armidale with producers providing

presentations on various topics in conjunction with representatives from ABRI and AGBU. The workshop was promoted to all TBTS stakeholder breed society BREEDPLAN herds and attracted 35 producers which represented 25 seedstock businesses. Of particular note was that many of the seedstock businesses attending represented some of the leading and influential herds within the breed.

**3.5.4 Summer and Winter SBTS & TBTS Update Newsletter:** A technical update newsletter for seedstock producers was developed and distributed twice yearly as a joint initiative with SBTS. The Technical Update is an effective extension avenue for keeping Seedstock producers informed on current developments in the genetic progress technology area and upcoming related extension initiatives. It is mailed to all BREEDPLAN members of the TBTS and SBTS stakeholder Breed Societies (approximately 2100 herds) and e-mailed to all non-BREEDPLAN members (approximately 1960 herds) with an e-mail address and who have recorded at least one calf with the society in a recent calving year.

This represents a distribution list of over 4000 seedstock businesses across Australia.

### Accessing Support in Application of Genetic Technologies

For support and assistance in the use and understanding of the different genetic technologies that are available, such as BREEDPLAN, BreedObject Selection Indexes, Internet Solutions, TakeStock & DNA based tools, please contact:

| Technical Consultant  | Breeds   | Contact Details  |
|-----------------------|--|--|
| <b>Christian Duff</b> | Charolais<br>Red Angus<br>Shorthorn<br>Simmental         | <a href="mailto:christian@sbts.une.edu.au">christian@sbts.une.edu.au</a><br>(02) 6773 2472   |
| <b>Andrew Byrne</b>   | Hereford<br>Murray Grey                                  | <a href="mailto:andrew@sbts.une.edu.au">andrew@sbts.une.edu.au</a><br>(02) 6773 3357   |
| <b>Phillip Mann</b>   | Belmont Red<br>Braforn<br>Brahman<br>Strangus<br>Charbay | Droughtmaster<br>Santa Gertrudis<br>Senepol<br>Simbrah<br><a href="mailto:philip@tbts.une.edu.au">philip@tbts.une.edu.au</a><br>(07) 4927 6066 |
| <b>Ashlee Austin</b>  | Blonde d'Aquitaine<br>Devon<br>Gelbvieh                  | Red Poll<br>Sales<br>South Devon<br><a href="mailto:ashlee@sbts.une.edu.au">ashlee@sbts.une.edu.au</a><br>(02) 6773 3056                       |
| <b>Alex McDonald</b>  | Limousin   | <a href="mailto:alex@limousin.com.au">alex@limousin.com.au</a><br>(02) 6771 1648   |
| <b>Peter Parnell</b>  | Angus  | <a href="mailto:peter@angusaustralia.com.au">peter@angusaustralia.com.au</a><br>(02) 6772 3011   |

Note: With Michael Bestia's departure, Wagyu members are advised to contact any of the above team members for assistance during the remainder of 2010. In early 2011, a specific member of the team will be appointed as the designated Wagyu contact.

If you would like any further information on SBTS and TBTS please contact:

|   |   |
|---|---|
| Southern Beef Technology Services<br>Telephone: (02) 6773 3555<br>Email: <a href="mailto:office@sbts.une.edu.au">office@sbts.une.edu.au</a><br>Web: <a href="http://sbts.une.edu.au">http://sbts.une.edu.au</a> | Tropical Beef Technology Services<br>Telephone: (07) 4927 6066<br>Email: <a href="mailto:office@tbts.une.edu.au">office@tbts.une.edu.au</a><br>Web: <a href="http://tbts.une.edu.au">http://tbts.une.edu.au</a> |
|---|---|

## Selection for Improved Fertility Using EBVs

**Brahmans selected on fertility traits (using Days to Calving and Scrotal Size EBVs) have shown improved conception rates of up to 45% when compared to unselected lines of commercial heifers in the Northern Territory.**

Following a previous emphasis on growth traits, the Northern Territory Department of Regional Development Primary Industry Fisheries and Resources have focused selection on improving fertility in their Brahman herd since 1994. The herd has been performance recorded for genetic evaluation through BREEDPLAN since 1996 with historical records included back to 1986. Selection of the herd has included culling of cows that fail to raise a calf every year, using only replacement heifers that are pregnant as yearlings following a 3 month mating period and the use of sires with low days Days to Calving EBVs (AI sires) or a high scoring index based on scrotal size, high % normal sperm as yearlings, dam age at first calf and calving history (bulls bred within herd).

The success of these selection protocols is clearly demonstrated in the genetic progress the herd has made for the fertility traits of Days to Calving and Scrotal Size compared to the breed average (Figures 1 and 2).

Figure 1: Comparison of the NT Department of Resources Brahman herd genetic trends for Scrotal Size with that of the Brahman breed

Figure 2: Comparison of the NT Department of Resources Brahman herd genetic trends for Days to Calving with that of the Brahman breed

A further confirmation of the improved fertility genetics in this Brahman herd was provided from the results of a recent trial which compared conception rates in yearling mated heifers from the Departments' herd to that achieved in commercial heifers. In this trial, approximately 100 high grade Brahman heifers were purchased each year for three years from three different commercial herds from their first round of weaners. These heifers were then tracked to the Departments' research property 220km South of Darwin and run with their heifers being used for comparison. The heifers were joined as yearlings from December to March and pregnancy tested 2 months after the bulls were

\*SBTS & TBTS PROVIDE A NATIONAL EXTENSION NETWORK FOR GENETIC TECHNOLOGIES FOR THE AUSTRALIAN BEEF SEEDSTOCK INDUSTRY\*

Figure 5: Front and backmaster pages of the Summer 2010 edition of the SBTS & TBTS Update

3.5.5 Technical Support to Breed Societies: Day to day technical support to participating Breed Societies was regularly provided in several forms:

- Assistance to Breed Society Boards, Technical Committees and Breed Society staff in matters relating to their BREEDPLAN evaluation.
- Assistance to Breed Society Boards, Technical Committees and Breed Society staff in both the maintenance of existing Selection Indexes and the development of new Selection Indexes.
- Assistance to Breed Society Boards, Technical Committees and Breed Society staff in matters relating to the add-on genetic technologies.
- Assistance to Breed Society Boards, Technical Committees and Breed Society staff in matters relating to the DNA genetic technologies and incorporation of DNA information into their BREEDPLAN evaluation.
- Assistance to Breed Society staff in interpretation of the preliminary GROUP BREEDPLAN results provided by ABRI. Assistance in provision of consequent authorisation by Breed Society to ABRI to release the results of each GROUP BREEDPLAN evaluation
- Contribution of articles to Breed Society publications and websites
- Representation of Breed Societies at the quarterly BREEDPLAN Technical Liaison Group (BTLG) meetings held in Armidale, NSW. This was followed by the provision of a summary report to Breed Society summarising key discussion points and outcomes.

3.5.6 Technical Support to Breed Societies members: Technical Support was regularly provided to members of each participating Breed Societies in several forms:

- Day to day assistance to Breed Society members in matters relating to genetic technologies (eg. BREEDPLAN, Selection Indexes, TakeStock, Gene Markers) through phone and email correspondence.
- On-property consultations (see section 3.5.1)
- Provision of information relating to the use and interpretation of the available genetic technologies on both the TBTS & BREEDPLAN websites.
- Circulation of regular updates on “new” genetic technology developments through the “SBTS & TBTS Update” newsletters (see section 3.5.4).

3.5.7 Maintenance of the TBTS website: The TBTS website (<http://tbts.une.edu.au>) was regularly reviewed and updated to ensure that it reflects the latest information regarding genetic progress technology and the upcoming or current TBTS extension and technical support activities. With the addition of webinars in the suite of extension activities, a specific web page was developed as a joint initiative with SBTS to provide a registration page for upcoming webinars and a place to list all past webinars for viewing by anyone and anytime. At the time of writing this report, sessions from the most recent webinar course titled “*Know Your Genes*” had been viewed 467 times.

### **3.6 Recommend a strategy for the continuation and funding of the services provided by TBTS beyond this project.**

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An application for MLA Donor Company (MDC) co-funding was submitted to the MDC board in May 2011 for the continuation of the TBTS project beyond August 31, 2011. This application was successful based on the co-funding arrangement of a 50/50 split between industry (ABRI/ breed Societies) and Commonwealth funds.

Under the new project agreement, the TBTS project will run for four years from September 1, 2011 through to August 31, 2015. The next phase of TBTS will be markedly different from those that preceded it. In particular, it plans to give the northern beef breeding industry a real 'shake-up' by **challenging it to double its rate of genetic improvement** while explaining the new technologies that can be used to achieve that bold objective.

The project objectives, to be achieved by August 31<sup>st</sup> 2015, are:

1. An increase in the average BreedObject selection index value of the Stakeholder Breed Societies by \$10 per cow mated between the 2009 drop (base year) and 2014 drop calves. This equates to \$2 per cow mated per year compared to the current weighted rate of genetic progress for the Tropical Breeds of \$1.05 per cow mated per year.
2. Develop and undertake extension initiatives to extend relevant messages to the Northern Australia Seedstock sector based on Beef CRC research outcomes with particular emphasis on R&D outcomes relevant to the genetic improvement of fertility traits in tropical breed cattle.
3. Undertake extension activities and provide technical support to implement both new and existing BREEDPLAN related technologies in Northern Australia Seedstock herds e.g. BREEDPLAN EBVs, Internet Solutions, BreedObject Selection Indexes, TakeStock®, Data Quality Herd Audit, Marker Assisted EBVs and Mate Selection tools. This will primarily involve a focussed approach on extension to key influential herds in each breed and will specifically include at least 40 one-on-one high-level consultations each year.
4. Undertake regular extension initiatives to inform the Seedstock and beef breeding industry in general on the relevance and application of DNA technology for accelerating genetic progress in economically important production traits.
5. Maintain and support the Selection Indexes published by Stakeholder Breed Societies to ensure they remain relevant to current and future markets and production systems. Where possible, also develop and publish Selection Indexes for stakeholder Breed Societies not currently doing so.
6. Provide high-level technical support to Beef Information Nucleus (BIN) projects in Northern Australia.

## 4 Impact on Meat and Livestock Industry

It has long been acknowledged that genetic progress in beef cattle is slow to achieve due to long generation intervals and, in many cases, low selection intensity on traits of economic importance. However, when genetic progress is achieved the benefits are cumulative and can be maintained at modest annual costs. The TBTS project has assisted many seedstock herds, and animals within those herds to be involved in Australia's national genetic evaluation program, BREEDPLAN.

TBTS has played an important role in the Northern beef industry having both a high level of awareness and significant use of BREEDPLAN EBVs as a selection tool. This has been achieved through a range of communication events over the term of the project including the

biannual SBTS & TBTS Update newsletter, two webinar courses involving over 1000 seedstock producers across Australia, 20 workshops/field days with an estimated audience of 601 producers and 51 on property consultations with seedstock herds in northern Australia.

The TBTS project has contributed to there being a significant number of animals within seedstock herds, and bulls available to commercial industry, having accurately described genetics. This is through published BREEDPLAN EBVs for a range of traits and Selection Indexes. While the number of BREEDPLAN herds and percentage of animals with at least one post birth-weight traits recorded for genetic analysis purposes has plateaued, the percentage of animals being recorded for other traits of economic importance such as fertility, carcase and temperament has significantly increased.

The improvement in profitability via genetic progress can be estimated by using the BreedObject Selection Index trends. BreedObject Selection Indexes indicate differences in net profit per cow mated. The increase of the combined Brahman and Santa Gertrudis Selection Index (see section 3.4) over the 3 year term of this project was \$4.50/per cow mated. Using this information together with the estimated 5.1 million breeding cows in tropical, sub-tropical and pastoral regions of Australia that are dominated by tropical cattle (Australian Bureau of Agriculture and Resource Economics (ABARE), April 2011), the overall genetic improvement in dollar terms can be calculated (assuming 20% of the females are mated to Brahman or Santa Gertrudis bulls from registered seedstock herds). This industry gain in dollar terms through genetic progress is approximately \$4.5 million per year (\$4.50/per cow mated x 1 million cows).

This benefit to industry is not instantaneous due to the lag time between the genetic improvement in the seedstock and commercial sector but it is both cumulative and on-going. These figures do not take into account the Brahman and Santa Gertrudis bulls that are breed in “multiplier” herds from sires from the registered sector or the genetic improvement of other breeds that are influential in Northern Australia such as Belmont Reds and Droughmasters.

## 5 Conclusions and Recommendations

The TBTS project continues to be an innovative concept by being a collaborative approach that is jointly co-funded by Breed Societies, ABRI and industry (through MLA). All parties have a vested interest in ensuring its success and the associated increase in genetic progress being achieved in tropical beef cattle populations.

Great success in meeting objectives was achieved in phases one, two and three of TBTS. Phase four (this project) has built on that initial success. TBTS is well positioned to play a vital role in the delivery of the complex genetic tools that are currently available (e.g BREEDPLAN EBVs, BreedObject Selection Indexes, Internet Solutions, TakeStock) or will be available (e.g Data Quality Herd Audit software, Mate Allocation software) to the Northern Beef industry.

While not all of the objectives as outlined at the commencement of this project have been met, good progress has been made and the service provided over the last 3 years has been highly valued by participating breeds and breeders. This is evidenced by the unanimous support of all stakeholders including MLA, ABRI and Breed Societies to continue for a 5<sup>th</sup> term.

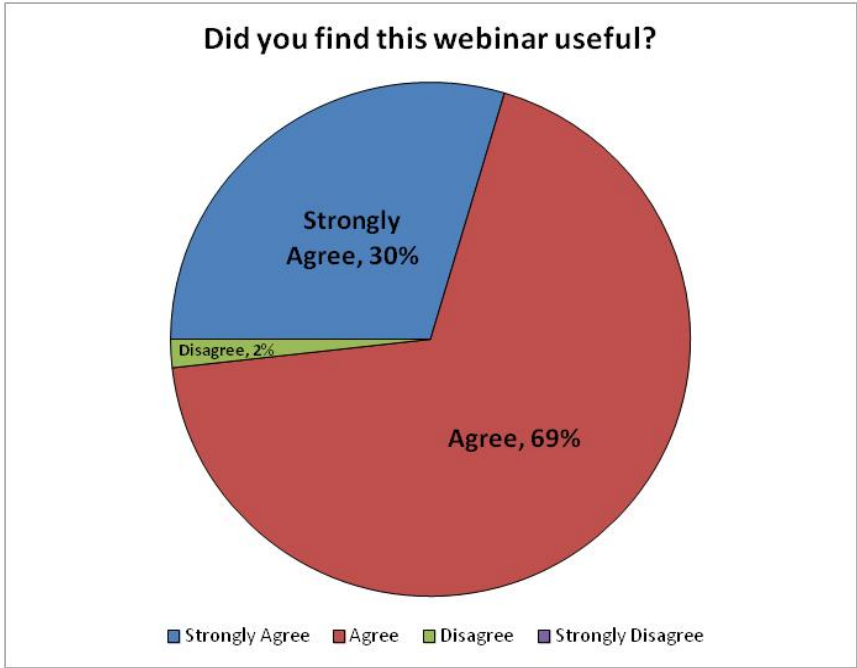


It is important that the activities and services offered by TBTS in its 5<sup>th</sup> term reflect what is required to assist with increasing the rates of genetic progress being observed in Australia's tropical beef cattle populations. This will see TBTS continue to offer a broad range of extension initiatives with the SBTS & TBTS network, however focus will primarily be aimed at "coaching" influential seedstock herds within each tropical cattle beef breed regarding performance recording for genetic evaluation and genetic progress.

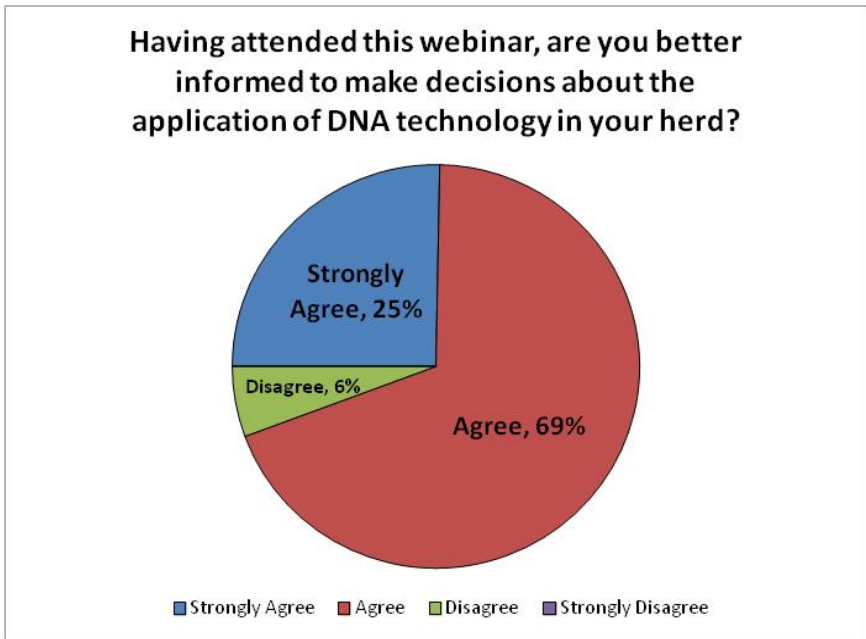
## 6 Appendices

### 6.1 Appendix 1

**Figure 6.** Overall audience poll results from the “Know your Genes” webinar Course – Question 1.



**Figure 7.** Overall audience poll results from the “Know your Genes” webinar Course – Question 2.



## 6.2 Appendix 2

**Table 13.** Attendance statistics for the “BREEDPLAN: From Go to Whoa” webinar course

|                    | Registered  |            | Attended   |            | Unique     |            |
|--------------------|-------------|------------|------------|------------|------------|------------|
|                    | Total       | Average    | Total      | Average    | Registered | Attended   |
| Angus              | 206         | 34         | 130        | 22         | 68         | 46         |
| Blonde d'Aquitaine | 29          | 5          | 16         | 3          | 9          | 7          |
| Charolais          | 96          | 16         | 62         | 10         | 28         | 21         |
| Devon              | 0           | 0          | 0          | 0          | 0          | 0          |
| Gelbvieh           | 12          | 2          | 9          | 2          | 2          | 2          |
| Hereford           | 144         | 24         | 89         | 15         | 47         | 35         |
| Limousin           | 128         | 21         | 87         | 15         | 39         | 31         |
| Murray Grey        | 38          | 6          | 27         | 5          | 12         | 9          |
| Red Angus          | 15          | 3          | 8          | 1          | 5          | 2          |
| Red Poll           | 15          | 3          | 10         | 2          | 4          | 3          |
| Salers             | 7           | 1          | 2          | 0          | 2          | 1          |
| Shorthorn          | 23          | 4          | 8          | 1          | 8          | 5          |
| Simmental          | 18          | 3          | 8          | 1          | 5          | 3          |
| South Devon        | 4           | 1          | 3          | 1          | 1          | 1          |
| Wagyu              | 74          | 12         | 30         | 5          | 30         | 14         |
| Belmont Red        | 3           | 1          | 0          | 0          | 2          | 0          |
| Braford            | 2           | 0          | 2          | 0          | 1          | 1          |
| Brahman            | 27          | 5          | 16         | 3          | 13         | 8          |
| Brangus            | 22          | 4          | 17         | 3          | 8          | 7          |
| Charbray           | 7           | 1          | 5          | 1          | 2          | 1          |
| Droughtmaster      | 12          | 2          | 7          | 1          | 7          | 4          |
| Santa Gertrudis    | 16          | 3          | 6          | 1          | 5          | 2          |
| Senepol            | 7           | 1          | 6          | 1          | 2          | 1          |
| Simbrah            | 0           | 0          | 0          | 0          | 0          | 0          |
| Lowline            | 7           | 1          | 6          | 1          | 2          | 2          |
| Other              | 114         | 19         | 65         | 11         | 28         | 26         |
| Total (SBTS)       | 809         | 135        | 489        | 82         | 260        | 180        |
| Total (TBTS)       | 96          | 16         | 59         | 10         | 40         | 24         |
| Total (Other)      | 121         | 20         | 71         | 12         | 30         | 28         |
| <b>Total</b>       | <b>1026</b> | <b>171</b> | <b>619</b> | <b>103</b> | <b>330</b> | <b>232</b> |

Nb. Some totals in the above statistics don't correspond with those tabled within the body of this report as a) attendees might be members of more than one breed society and b) identification of “unique” attendees relied upon attendee entering the same email address when registering for each webinar session.

**Table 14.** Attendance statistics for the “Know Your Genes” webinar course

| Breed              | Registered |         | Attended |         | Unique     |          |
|--------------------|------------|---------|----------|---------|------------|----------|
|                    | Total      | Average | Total    | Average | Registered | Attended |
| Angus              | 182        | 30      | 104      | 17      | 81         | 45       |
| Blonde d'Aquitaine | 12         | 2       | 4        | 1       | 6          | 3        |
| Charolais          | 36         | 6       | 21       | 4       | 18         | 8        |
| Devon              | 5          | 1       | 2        | 0       | 2          | 1        |
| Gelbvieh           | 5          | 1       | 3        | 1       | 4          | 2        |
| Hereford           | 112        | 19      | 65       | 11      | 44         | 24       |
| Limousin           | 155        | 26      | 97       | 16      | 69         | 39       |
| Murray Grey        | 42         | 7       | 29       | 5       | 21         | 12       |
| Red Angus          | 43         | 7       | 31       | 5       | 18         | 9        |
| Red Poll           | 6          | 1       | 5        | 1       | 3          | 2        |
| Salers             | 1          | 0       | 0        | 0       | 1          | 0        |
| Shorthorn          | 16         | 3       | 7        | 1       | 9          | 3        |
| Simmental          | 16         | 3       | 10       | 2       | 7          | 3        |
| South Devon        | 5          | 1       | 3        | 1       | 5          | 3        |
| Wagyu              | 30         | 5       | 17       | 3       | 13         | 6        |
| Belmont Red        | 0          | 0       | 0        | 0       | 0          | 0        |
| Braford            | 2          | 0       | 2        | 0       | 1          | 1        |
| Brahman            | 46         | 8       | 25       | 4       | 26         | 12       |
| Brangus            | 21         | 4       | 11       | 2       | 9          | 4        |
| Charbray           | 8          | 1       | 7        | 1       | 3          | 2        |
| Droughtmaster      | 40         | 7       | 15       | 3       | 19         | 8        |
| Santa Gertrudis    | 11         | 2       | 6        | 1       | 7          | 2        |
| Senepol            | 8          | 1       | 6        | 1       | 3          | 1        |
| Simbrah            | 0          | 0       | 0        | 0       | 0          | 0        |
| Overseas           | 26         | 4       | 25       | 4       | 10         | 9        |
| Other              | 99         | 17      | 63       | 11      | 45         | 24       |
| Total (SBTS)       | 666        | 111     | 398      | 66      | 301        | 160      |
| Total (TBTS)       | 136        | 23      | 72       | 12      | 68         | 30       |
| Total (Other)      | 125        | 21      | 88       | 15      | 55         | 33       |
| Total              | 927        | 155     | 558      | 93      | 424        | 223      |

Nb. Some totals in the above statistics don't correspond with those tabled within the body of this report as a) attendees might be members of more than one breed society and b) identification of “unique” attendees relied upon attendee entering the same email address when registering for each webinar session.