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On farm

NORTHERN BREEDPLAN TECHNICAL OFFICER

Project number NAP3.113

Final report prepared for MLA by**:**

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Table of Contents

1. Summary

Meat and Livestock Australia (MLA), the Agricultural Business Research Institute (ABRI) and a range of Tropical Breed Societies agreed, in 1998, to jointly fund a Northern BREEDPLAN Technical Officer for tropically adapted cattle. The Technical Officer, operating within the entity known as Tropical Cattle Technology Services (TCTS), has now completed its fourth year of operation. Progress made against the majority of Project goals, and in particular the specific measurable goal of doubling the number of calves analysed on BREEDPLAN, was achieved in advance of targets.

In 1998, it was estimated that only 6% of tropically adapted bulls in use were evaluated by BREEDPLAN. Since it had been shown in southern Australia that the use of BREEDPLAN bulls has delivered significant genetic improvement, it was decided to work with industry to increase the rate of adoption of BREEDPLAN in northern Australia.

In collaboration with activities being conducted with the Tropical Breed Societies and extension groups, the Northern BREEDPLAN Technical Officer was able to achieve the following within tropically adapted breeds between 1998 and 2002:

An increase in the number of calves recorded on BREEDPLAN per year from 11,751 to 26,008
An increase in the number of herds enrolled in BREEDPLAN from 125 to 231
An increase in the percentage of Herdbook recorded calves on BREEDPLAN from 22% to 44% (during this period the number of Herdbook recorded calves also rose by 8.2%)
The majority of breeds now run GROUP BREEDPLAN analyses

The Brahman $Index (which estimates the value of animals for production of 100 day fed export weight carcasses) has increased by $1/cow/year over the last three years. This shows that the genetic improvement through BREEDPLAN translates to economic benefits in beef production.

The Northern BREEDPLAN Technical Officer has also assisted producers in the usage of personal computers to record pedigree and performance data enabling direct submission to Society and BREEDPLAN databases. As electronic submission of data has increased steadily over the past four years, this will lead to increased quality of data, and as a result, improved BREEDPLAN accuracy.

Due to the success of this project, the Northern BREEDPLAN Technical Officer will continue to be funded by MLA, ABRI and the Tropical Breed Societies for an additional three years.

2. Introduction

Continued BREEDPLAN development in northern Australia is important as this region represents over 60% of the Australian beef herd. The role of improved genetics has strong support from the major pastoral companies, which, through their buying power are sending clear messages to the breeds utilised in their breeding programs. While difficult to measure, it is believed that during the four years of the TCTS project, there has been a steady growth in demand for objectively measured stock from the broader bull buying community, albeit there is still ample scope for better selection decision making by many in the industry.

For a number of seedstock breeders the lack of direct impact on sales, and hence their income from bull sales, will remain sufficient reason not to commence performance recording. While some of these breeders recognise the economic value of genetic gain in their respective herds, this is much less tangible in the short term than an increase in bull prices.

The level of response to development of BREEDPLAN recording continues to vary significantly between breeds. This is primarily a reflection of commercial pressure, the length of time GROUP BREEDPLAN has been available, utilisation by breed 'leaders' and pro-activity of their respective Boards.

2.1 Progress in Achieving Project Objectives

The Strategic and Operational Plans drafted in December 1998 included ten main project objectives. Progress against these objectives is as follows:

3. Double the use of BREEDPLAN by Tropical Breeds, over four years

When this project was being planned, the available statistics showed that 11,750 tropical breed calves born during the 1996 calving year had been performance recorded in BREEDPLAN. This became the base against which progress in the adoption of BREEDPLAN was to be measured.
The two targets adopted were:

to increase the number of calves recorded on BREEDPLAN in year 2000 to 16,500, and
to increase the numbers of calves recorded on BREEDPLAN in year 2002 to 23,500 (ie. double the base number).

Table 1 shows the number of 1997, 1998, 1999, 2000 and 2001 calves (as defined by calving year) performance recorded in BREEDPLAN by the tropical breeds. Note that some calves tend not to be recorded on BREEDPLAN in the same year as their calving year.

The first (year 2000) target of having 16,500 calves recorded on BREEDPLAN was exceeded in 1999, one year ahead of schedule. The 2002 target of 23,500 tropical breed calves evaluated in BREEDPLAN was exceeded in 2000 by 2,508 or 10.7%

Table 1: No. of Calves Recorded on BREEDPLAN by Calving Year
Compared with TCTS Targets

Calving Year	Brahman	Santa Gertrudis	Drought-master	Braford	Brangus	Belmont Red	Total
1996 (base year)	4,696	3,732	481	291	621	1930	11,751
1997	7,818	6,479	1,269	524	1,113	3,258	20,461
1998	8,839	7,068	2,114	534	1,255	3,083	22,893
1999	10,030	7,520	2,501	521	1,238	2,704	24,514
2000	10,313	8,520	2,847	475	1,693	2,160	26,008
2001*	8,961	7,526	2,440	443	922	1,850	22,142
2000 Target	6,000	5,000	1,500	600	1,000	2,400	16,500
2002 Target	8,200	6,600	3,000	1,200	1,500	3,000	23,500

* for some herds, 2001 calf weights are yet to be submitted. For example, the 2000-born calves recorded increased from 23,238 to 26,008, an increase of 2770 or 12%, between July 2001 and July 2002.

Brahman, Santa Gertrudis and Brangus have comfortably passed their 2002 targets with Droughtmaster breeders just 153 calves short of their target.

The Belmont Red database has continued its database audit via herd ancestry reporting to breeders to fill historic pedigree gaps in preparation for a full breed code rebuild to better utilise the cross-bred analysis capabilities of the current version of BREEDPLAN.

Australian Registered Cattle Breeders Association (ARCBA) registration statistics for 2001 show that 2,394 new Belmont Red animals were recorded and potentially available for BREEDPLAN evaluation. Hence, the 2002 goal of achieving 3,000 BREEDPLAN recorded Belmont Red calves in not possible. Table 3, below, shows that the Belmont Red society is evaluating 88.8% of calves, which rates their utilisation of BREEDPLAN with the leading Taurus societies.

The number of herds currently enrolled in BREEDPLAN is summarised in Table 2.

Table 2: BREEDPLAN Membership

	Brahman	Santa Gertrudis	Drought-master	Brangus	Belmont Red	Braford	Total
1998	45	42	12	8	12	6	125
1999	51	59	23	14	18	7	172
2000	58	73	26	18	17	9	201
2001	67	81	27	18	17	9	219
2002	71	88	29	18	14	11	231
Increase since 1998	58%	109%	142%	125%	17%	83%	85%

Simbrah numbers are not presented in tables 1 or 2 as they are difficult to distinguish due to being included in the Simmental herd book.

When considering these statistics it should be understood that within all breeds there are a relatively large number of small herds, many of which will find it difficult to implement BREEDPLAN effectively. While this problem exists for all breeds it is more significant in the tropical breeds due to lower utilisation of AI and the effect of their (generally) longer joining and subsequent calving periods on formation of effective contemporary groups.

While it is useful to monitor the number of herds enrolled in BREEDPLAN and the number of calves those breeders are recording, to assess the level of uptake it is more relevant to compare the number of calves analysed with the number being recorded. To do this calf recording statistics presented at the 2002 ARCBA AGM have been used. These statistics report the number of calves recorded in the Society's Primary and Secondary Registers during calendar year 2001 and have been compared with the number of 2000 calving year calves recorded on BREEDPLAN, in Table 3.

Table 3: Calves Recorded on BREEDPLAN Compared with Calves Herdbook Recorded in 2001

	Brahman	Santa Gertrudis	Drought-master	Braford	Brangus	Belmont Red	Total
2000 calving year calves recorded on BREEDPLAN	10,313	8,520	2,847	475	1,693	2,160	26,008
Calves recorded in 2001*	26,190	16,446	9,376	2,318	2,220	2,394	58,944
% BREEDPLAN Recorded	39.4%	51.8%	30.4%	21.4%	76.3%	88.8%	44.1%

** Calves recorded in Primary & Secondary Registers of breed societies in 2001 irrespective of date of birth; as reported by ARCBA.*

The above comparison of calves recorded by breed societies during the year 2001 with 2000 drop BREEDPLAN-recorded calves illustrates that a significant proportion of most tropical breeds are now being evaluated.

Table 4 provides a comparison of the 1996 base year with the current position, based on the number of BREEDPLAN evaluated calves as a percentage of calves recorded in Primary and Secondary Registers.

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Table 4: Calves Recorded on BREEDPLAN Compared With Calves Herd Book Recorded in 1996

	Brahman	Santa Gertrudis	Drought-master	Braford	Brangus	Belmont Red	Total
1996 Calves recorded on BREEDPLAN	4,696	3,732	481	291	621	1,930	11751
Calves recorded*	23,280	16,874	7,590	3,070	1,730	2,202	54,474
% BREEDPLAN Recorded in 1996	20.2%	22.1%	6.3%	9.5%	35.9%	87.6%	22.1%
% BREEDPLAN Recorded in 2002#	39.4%	51.8%	30.4%	21.4%	76.3%	88.8%	44.1%

** Primary & Secondary Registers, as reported by ARCBA.*
 # From Table 3.

Important points coming out of Tables 3 and 4 are that:

The number of calves for seedstock purposes recorded by tropical breeds has increased by 8.2% between 1996 and 2000 from 54,474 to 58,944.

The percentage of current calves evaluated by BREEDPLAN has risen from 22.1% to 44.1% in just 4 years

The following breed tables are an attempt to describe the flow through effect of EBV-rated genetics and give a clearer picture of the impact of BREEDPLAN beyond those herds that are actively evaluating their stock. They are based on a simple count of animals in each calving year, irrespective of when the animal entered the Herdbook (therefore it should be noted that this will reflect both current and historic pedigree and performance data submissions).

An animal is counted as 'In BREEDPLAN' if it has a post birth weight record. The number of animals 'In' and 'Not In' BREEDPLAN are expressed as raw counts and percentages. Those animals 'Not In' BREEDPLAN were further checked to identify if they have an EBV rated sire or maternal grand sire. From this the total BREEDPLAN impact, expressed as a percentage, is given for each calving year.

All breeds show a strong flow though effect to unrecorded herds which clearly illustrates that BREEDPLAN performance recorded herds are the key suppliers of seedstock sires within their respective breeds.

It must be clearly understood that these tables do NOT reflect the change that has occurred over time. This is due to the flow back effect when new herds join BREEDPLAN, particularly when they do so with a substantial quantity of historic data.

Table 5: Brahman

Calving Year	Total Calves	No. In B'PLAN	% In B'PLAN	Not In B'PLAN	% Not In B'PLAN	Non BP-Sire/MGS in BP	Total BP Impact %
1990	25510	3946	15.5	21564	84.5	17113	82.6
1991	25611	4495	17.6	21116	82.4	16878	83.5
1992	25531	4450	17.4	21081	82.6	17044	84.2
1993	20911	4709	22.5	16202	77.5	13203	85.7
1994	19586	4749	24.2	14837	75.8	11657	83.8
1995	21615	6488	30.0	15127	70.0	11802	84.6
1996	22517	7071	31.4	15446	68.6	11782	83.7
1997	23772	7726	32.5	16046	67.5	12353	84.5
1998	23591	8783	37.2	14808	62.8	11217	84.8
1999	23133	9998	43.2	13135	56.8	9832	85.7
2000	21259	10159	47.8	11100	52.2	8483	87.7
2001	15386	6521	42.4	8865	57.6	7425	90.6

Table 6: Santa Gertrudis

Calving Year	Total Calves	No. In B'PLAN	% In B'PLAN	Not In B'PLAN	% Not In B'PLAN	Non BP-Sire/MGS in BP	Total BP Impact %
1990	20601	2967	14.4	17634	85.6	14757	86.0
1991	19025	3488	18.3	15537	81.7	13167	87.5
1992	18281	3548	19.4	14733	80.6	12497	87.8
1993	19049	4517	23.7	14532	76.3	12218	87.9
1994	17468	4644	26.6	12824	73.4	10739	88.1
1995	17160	4926	28.7	12234	71.3	10753	91.4
1996	17023	5122	30.1	11901	69.9	10272	90.4
1997	16208	6161	38.0	10047	62.0	8722	91.8
1998	15408	6821	44.3	8587	55.7	7189	90.9
1999	15497	7350	47.4	8147	52.6	6629	90.2
2000	15423	8271	53.6	7152	46.4	5736	90.8
2001	13371	7310	54.7	6061	45.3	5169	93.3

Table 7: Droughtmaster

Calving Year	Total Calves	No. In B'PLAN	% In B'PLAN	Not In B'PLAN	% Not In B'PLAN	Non BP-Sire/MGS in BP	Total BP Impact %
1990	8564	1071	12.5	7493	87.5	5999	82.6
1991	8157	1054	12.9	7103	87.1	5732	83.2
1992	7121	703	9.9	6418	90.1	5201	82.9
1993	8007	653	8.2	7354	91.8	5684	79.1
1994	6966	558	8.0	6408	92.0	5104	81.3
1995	7461	597	8.0	6864	92.0	5402	80.4
1996	7392	666	9.0	6726	91.0	5114	78.2
1997	7722	1205	15.6	6517	84.4	4753	77.2
1998	8638	2097	24.3	6541	75.7	4677	78.4
1999	8649	2470	28.6	6179	71.4	4128	76.3
2000	8847	2817	31.8	6030	68.2	4133	78.6
2001	5762	2405	41.7	3357	58.3	2569	86.3

Table 8: Braford

Calving Year	Total Calves	No. In B'PLAN	% In B'PLAN	Not In B'PLAN	% Not In B'PLAN	Non BP-Sire/MGS in BP	Total BP Impact %
1990	6040	200	3.3	5840	96.7	2961	52.3
1991	5156	196	3.8	4960	96.2	2708	56.3
1992	4333	189	4.4	4144	95.6	2172	54.5
1993	3740	202	5.4	3538	94.6	1908	56.4
1994	3357	245	7.3	3112	92.7	1742	59.2
1995	2895	258	8.9	2637	91.1	1515	61.2
1996	2752	379	13.8	2373	86.2	1344	62.6
1997	2503	519	20.7	1984	79.3	1086	64.1
1998	2451	518	21.1	1933	78.9	948	59.8
1999	2355	475	20.2	1880	79.8	1044	64.5
2000	2320	364	15.7	1956	84.3	1163	65.8
2001	1213	260	21.4	953	78.6	602	71.1

Table 9: Brangus

Calving Year	Total Calves	No. In B'PLAN	% In B'PLAN	Not In B'PLAN	% Not In B'PLAN	Non BP-Sire/MGS in BP	Total BP Impact %
1990	1499	318	21.2	1181	78.8	925	82.9
1991	1457	390	26.8	1067	73.2	821	83.1
1992	1766	399	22.6	1367	77.4	969	77.5
1993	2044	522	25.5	1522	74.5	1195	84.0
1994	1944	580	29.8	1364	70.2	1090	85.9
1995	2193	771	35.2	1422	64.8	1171	88.6
1996	2398	900	37.5	1498	62.5	1173	86.4
1997	2607	1100	42.2	1507	57.8	1189	87.8
1998	2691	1245	46.3	1446	53.7	1050	85.3
1999	2710	1199	44.2	1511	55.8	1072	83.8
2000	2917	1666	57.1	1251	42.9	883	87.4
2001	1691	446	26.4	1245	73.6	1015	86.4

Table 10: Belmont Red

Calving Year	Total Calves	No. In B'PLAN	% In B'PLAN	Not In B'PLAN	% Not In B'PLAN	Non BP-Sire/MGS in BP	Total BP Impact %
1990	2763	2271	82.2	492	17.8	316	93.6
1991	2611	2274	87.1	337	12.9	257	96.9
1992	3005	1868	62.2	1137	37.8	707	85.7
1993	2441	1491	61.1	950	38.9	842	95.6
1994	2720	1827	67.2	893	32.8	772	95.6
1995	3121	2416	77.4	705	22.6	590	96.3
1996	2978	2316	77.8	662	22.2	596	97.8
1997	3182	2615	82.2	567	17.8	496	97.8
1998	3299	2754	83.5	545	16.5	414	96.0
1999	2952	2478	83.9	474	16.1	421	98.2
2000	2619	1897	72.4	722	27.6	630	96.5
2001	2196	1107	50.4	1089	49.6	1020	96.9

4. Establish GROUP BREEDPLAN analyses for Braford, Brangus and Droughtmaster by July 2000

This goal has been achieved although both Braford and Brangus do not currently have a publishable Sire Summary.

Both breeds have run their second analysis in 2002 with results being released to participating breeders. This year Brangus will publish a sire list. However, the number of Braford bulls available is inadequate to publish a reasonable sire list.

Not having a Sire Summary as the public flagship for these breeds has been a hurdle in generating commercial awareness with a subsequent flow on to seedstock breeders.

The Droughtmaster society analysis and Sire Summary is now an established annual event for the breed.

5. Assist all tropical breeds to run GROUP BREEDPLAN and further develop current analyses to include fertility and carcase information in addition to growth data

Belmont Red, Braford, Brahman, Brangus, Droughtmaster and Santa Gertrudis now all run GROUP BREEDPLAN analyses with Simbrah having access to analysis through the Simmental society. These analyses include growth, fertility and carcase traits.

There continues to be a role for liaison with breeders, societies, Animal Genetics and Breeding Unit (AGBU) and ABRI staff to address various data handling, analysis and reporting issues. The Northern BREEDPLAN Technical Officer is well positioned to fulfil this role.

The Australian Brahman Breeders Association was the first tropical breed to publish a Days to Calving (DC) EBV, to complement Scrotal Size. The Belmont Red, Droughtmaster and Santa Gertrudis societies have expressed interest in generating DC EBVs and will benefit from AGBU's development with Brahman.

For the breeds with recently established GROUP BREEDPLAN analyses, development of fertility EBVs is the first priority before they are encouraged to undertake the additional work and cost of scanning for carcase traits.

The priority for Brangus and Braford remains developing quality genetic linkage to improve the quality and stability of their analyses while also developing fertility traits.

6. Assist breeders with relevant software for on-farm computers

The main demand for personal computer (PC) support continues to be for herd recording programs, email, and to a lesser degree general windows based software and the internet.

There has been a steady growth in internet usage, and in particular email. Utilisation of email for electronic submission of registration and BREEDPLAN data is increasing.

Developing PC herd recording skills will be of long-term benefit to the cost-effective delivery of BREEDPLAN and to curbing herd recording costs for breed societies which have electronic batch registration systems. It is pleasing to see a number of societies offering calf recording cost discounts to encourage more breeders to utilise PC recording software. In the longer term this will create efficiencies in data collection.

PC utilisation also contributes to data quality as it creates an initial data check before pedigree and performance data is submitted.

The Brahman and Santa Gertrudis societies lead the tropical breeds in development of web-based services with fully interactive and searchable pedigree and performance Herdbooks and sale catalogues. The Brahman system has been functioning for three years now and it is pleasing to note the rapid growth in use. The 2001 Brahman Week bull sale catalogue received some 20,000 hits.

Santa Gertrudis introduced their web system this year and must now take a pro-active role educating their seedstock and commercial breeders in the benefits it can deliver, as the ABBA have done.

7. Contribute to field days on beef breeding, selection, meat quality, marketing etc

There continues to be an array of opportunities to make contributions to field days and workshops for seedstock and commercial breeders. These events have included:

- Longreach Pastoral College students and stud herd manager
- Emerald Agricultural College
- CRC Beef School, Emerald
- Stud client open days
- PC workshops
- Brangus seminar, Dalby
- Droughtmaster Summer Seminar, Brisbane
- Brahman breeders bull selection day, Home Hill
- QDPI, Smart Manager Workshop, Atherton
- North Queensland Field Days, Townsville
- Santa Beef School, Longreach
- Brahman World Congress
- Belmont Red strategic planning workshop

It is envisaged that opportunities to contribute to these types of events will be ongoing.

These events provide a good opportunity to introduce more stud and commercial breeders to basic principles of genetic improvement, the role of objective measurement and BREEDPLAN in balanced selection to achieve breeding objectives.

8. Improve the quality of data submitted for analysis

Although the specific measurable goal of this project was to double the use of BREEDPLAN by tropical breeds over four years, it is equally important to ensure that data quality is maintained and, desirably, improved as it is the key to a quality analysis.

The primary way of achieving this is to ensure that breeders better understand what constitutes ‘good’ data. However, even with good intentions, breeders in extensive country face difficulties not encountered in smaller holdings. A simple example of this is knowing a calf’s date of birth.

All breeds, and particularly those which recently commenced GROUP BREEDPLAN analyses, have a strong ongoing need to educate new and current users on data quality and improve their general understanding of BREEDPLAN.

Workshops and discussion groups are an effective method of educating breeders about data quality issues. Although time consuming, one-on-one discussions during on-farm visits are the most effective way of getting to understand an individual herd’s management to identify ways to improve data quality.

The respective data processing staff at ABRI continue to be a proactive and valuable source of information to identify problem data.

AGBU is currently developing audit software that will not only monitor indicators of genetic gain but should also have the capacity to identify poor quality data which in turn will allow targeting of these herds to improve their data quality.

Breeders using PC herd recording programs are benefiting from more streamlined pedigree and performance data entry, some on-farm data quality checks and removal of one level of potential data entry error through electronic submission and uptake of pedigree and performance information by their society and BREEDPLAN.

Diagnostic analysis of EBVs continues to been undertaken for individual herds where the breeders are concerned that the EBVs don't appear to fairly represent an animal. The increased demand due to changes introduced by BREEDPLAN V4.1 in 1999 has dropped away but it may reoccur after the 2002 analyses when updated genetic parameters are introduced.

9. Liaise with industry groups such as the Tropical Beef Centre, Q.D.P.I. Beef Genetic staff and the Beef C.R.C. (Meat Quality) to assist in extension of findings

Good relationships continue to be enjoyed with industry groups such as the Tropical Beef Centre, QDPI and CRC. These groups, where appropriate, continue to direct breeders, stud and commercial, to the Northern BREEDPLAN Technical Officer for more detailed discussions on performance recording and other issues.

10. Assist breeders with development of strategic marketing alliances

There was limited opportunity and requests to assist marketing groups to identify improved genetics or assist in the development of strategic marketing alliances.

11. Liaise with Meat Standards Australia to develop pathways for higher *Bos indicus* content cattle

MSA has been and continues to be a topical issue among some northern breeders but this appears to be easing as more breeders become familiar with developments in cut grading. There are now significant numbers of cattle with mid to higher levels of *Bos indicus* blood achieving acceptable levels of grading.

A review of grading performance has been commenced for the Droughtmaster Society and upon completion may also be of interest to the other Taur-indicus breeds.

12. Develop a consulting service

During 2001/02, four days work were undertaken as a member of MLA's development team for their "Breeding EDGE" producer workshops. Limited other opportunities became available.

13. Communication

TCTS continues to use a range of communication media as opportunities arise including:

- ABC radio
- Continued contact with industry bodies and focus groups: QDPI, CRC, MSA, RBRC's, BIA, producer beef marketing alliance groups
- Breed society Councils and sub-committees
- Breed society publications
- BREEDPLAN news
- Direct contact with breeders
- Discussion groups and training workshops
- Northern Muster

14. BREEDPLAN Technical Liaison Group (BTLG)

Brian Sundstrom, BREEDPLAN National Coordinator convenes a BTLG meeting once per quarter in Armidale. It is attended by the technical advisors to the major British and European breeds. Its purpose is to discuss desirable technical developments of BREEDPLAN, implementation of those developments and priorities for BREEDPLAN research by AGBU.

The Northern BREEDPLAN Technical Officer represented the Tropical breeds at this meeting. Trips to Armidale also allowed ongoing discussion of operational issues with ABRI's BREEDPLAN team and AGBU.

This continued interaction will assist in improving the level of service to tropical breed users and facilitate growth of the service among the tropical breeds.

15. The future of the Northern BREEDPLAN Technical Officer

The achievements of the Northern BREEDPLAN Technical Officer project, especially against the quantitative project objectives, have been endorsed by the project's funders (MLA, ABRI and a range of Tropical Breed Societies). However, whilst much progress has been made in terms of the awareness and use of BREEDPLAN, there is still much to be done. Therefore, as a result of both the success of the current project and the continuing need to develop and build upon this success, the funding groups have agreed to continue the Northern BREEDPLAN Technical Officer project for an additional three years.