



final report

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Breedcow and Dynama software redevelopment

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Abstract

The project renewed the Breedcow and Dynama software making it compatible with modern computer operating systems and platforms. Enhancements were also made to the linkages between the individual programs and their operation.

The suite of programs is a critical component of the skill set required to make soundly based plans and production choices in the north Australian beef industry.

The Breedcow and Dynama software package is available at:
http://www.daff.qld.gov.au/16_6886.htm

Executive summary

This Breedcow and Dynama software redevelopment project allows continued use of the herd modelling and beef economic software package. It was identified as a key component of industry skills training and relied upon its renewal to be compatible with new computer systems.

The objectives of this project were to:

1. Reproduce the current suite of Breedcow Dynama programs as stand-alone software applications that run on the Windows.net framework using Microsoft Visual Studio[®].
2. Rewrite the existing user manual to suit the format of the redeveloped suite of programs.
3. Include representative herd templates for northern Australia in the new Breedcow Dynama package.

The project has met or exceeded its targets including the key objective of maintaining the capacity to further develop the software as needs arise. The availability of the Microsoft Excel[®] version of the programs provides a useful link to the future for the suite of programs and allows development to occur as required.

Software presentations included as an output of the original project were changed to training workshops after a clear message was received from a variety of users including government agencies and private companies. The 'roadshow' workshops focussed on herd modelling and beef economics and were undertaken at seven sites across northern Australia. The new version of the Breedcow and Dynama suite of programs provided the analysis framework for scenarios of interest to participants. For example, we explored what were viable options for northern beef producers if the live export market failed or was further reduced. The average rating for the presentation and conduct of the workshop was 6 out of 7, with participants providing useful feedback on workshop delivery and the features of the software.

The critical role of herd modelling and beef economics in the formation of soundly based plans and production choices being made by beef industry participants has not diminished. Neither has the capacity of the Breedcow and Dynama suite of programs to underpin such decisions with rigorous and conceptually sound processes. Even so, there does appear to be a gap arising in the ability of industry to access suitable training in the skills that underpin effective and rigorous decision making.

We believe it is critical that courses /workshops designed to train industry in the skills that underpin effective decision making remain a focus of RD&E funders and Government agencies. The Breedcow and Dynama suite of programs are seen as a critical component of this process for north Australian beef producers.

It is also essential that the software engineering capacity within the Department of Agriculture Fisheries and Forestry, Queensland (DAFFQ) is maintained. This will allow the continuous improvement of the suite of programs as the need arises.

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1 Background

The Breedcow and Dynama herd budgeting software package is the distillation of 40 years of professional experience dealing with the analytical issues around herd management decisions, with the emphasis on the extensive northern beef industry.

It was originally developed for distribution in a package called Visual Baler. This software package is no longer supported and is not compatible with 64-Bit operating systems. Continued use of the software package was identified as a key component of industry skills training and relied upon its renewal to be compatible with new computer operating systems. The Breedcow and Dynama software redevelopment project has ensured the software will be available in the future.

2 Project objectives

The objectives were to:

1. Reproduce the current suite of Breedcow Dynama programs as stand-alone software applications that run on the Windows.net framework using Microsoft Visual Studio[®]
2. Rewrite the existing user manual to suit the format of the redeveloped suite of programs
3. Include representative herd templates for northern Australia in the new Breedcow Dynama package.

The project has met and exceeded these objectives.

3 Methodology

One goal of the project was to ensure the availability of the software in the future. This required rebuilding the software using a more scalable and robust technology.

To allow this to happen the new suite of programs were configured in Microsoft Excel[®] as individual workbooks as well as the stand alone executable programs. This allows more experienced users to experiment with changes and or enhancements in Excel[®] prior to their implementation in the standalone format.

The Excel[®] version of the programs do not have the complete suite of enhancements available in the stand alone version, but allow much more flexibility in their use.

Therefore, the new software has an integrated Excel[®] workbook and executable program framework that allows Excel[®] functionality without the need of Excel[®]. Some benefits of the design framework are:

- new models are easily integrated into the software;
- standardised toolbars and macros are applied across applications; and
- existing models are easily updated or modified.

The programming task was completed “in house” allowing the source code to be held by the DAFFQ. This will facilitate error removal and the incorporation of improvements over time.

4 Results

The task proved to be more complex than expected. The rewriting of the software required the interpretation of more than 8000 formulas and 5000 lines of programming. Even though the original programs were available to allow the comparison of the outcomes of calculations, the requirement to shift to a new platform caused a number of delays in replicating the original software. The delays were made worse by the need to implement a number of changes to the operation of the programs – made at the insistence of users of the programs and not a planned component of the original project.

Once the software was available for testing, it was found that “enhancements” made to Windows 7 by Microsoft and the failure of a number of agency users to keep their Microsoft software up to date again caused delays in the full testing of the programs.

4.1 Specific issues resolved

Visual Baler had the capacity to override and subsequently restore formula cells. This function was used extensively in the original multi-year programs (Dynama, Prices, Monthcfl, and Taxinc) to set defaults which could be overridden with numeric entries (with the option to restore the formulas if there is a change of mind). This feature had proved to be invaluable and was successfully added to the new version. An “undo” process was also added to allow users to undo the most recent data entries.

Visual Baler had the capacity to save data only files, conferring two benefits – the original files were not recycled and therefore could not pick up corruptions, and the data files were very small. This capacity is maintained. The new version also uses different file extensions for each program making it much easier to identify the parent program.

The File Combine command in Visual Baler allowed the extraction and loading onto the screen of partial data from saved data (.bdt) files. The capacity was replicated to allow the rapid transfer of data between programs and within programs.

Breedcow and Dynama version 5 comprised eleven programs. At least three of the eleven (AECalc, Prices and Huscosts) were predicated on the system of calculating outputs in a separate program for later transfer to Bcowplus or Dynama. AECalc, Prices and Huscosts are now fully integrated into Breedcow and Dynama version 6 as worksheets in the new Dynamaplus and Breedcowplus programs. This allows the immediate linking of program inputs and outputs with users still capable of extracting the input values from any of the individual worksheets for transfer to alternative scenarios.

The original accessory programs for Dynama of Monthcfl and Taxinc were also integrated into the new Dynamaplus program to allow ease of use. The program Investan is preserved as a separate entity due to its need to link to separate Dynamaplus scenarios.

The program Splitsal was improved so that calculations now occur as data is entered and do not rely on the running of a separate macro.

The original Dynama only allowed one set of AE ratings to be used across the 10 years of the modelling framework. The new Dynamaplus allows the manipulation of AE ratings within each year of the model. This allows more complex analyses of nutrition, pasture improvement or land management to be more easily undertaken where a change in paddock weights over time is a consequence of the intervention. Allowing AE ratings to vary across years significantly increases the discipline applied when undertaking the analysis of such things as research to improve growth or feed conversion efficiency.

The existing user manual has been rewritten to suit the format of the redeveloped suite of programs. Significant enhancement of the readability of the manual is also currently being undertaken as an “add on” to the project.

The current Breedcow and Dynama version 5 has been maintained in its state of development and will continue to be available after the introduction of the redeveloped suite of programs. This allows users of that version to continue without change until they upgrade their computer to an operating system incompatible with Version 5.

The representative herd templates for northern Australia have been brought up to date in the new Breedcow Dynama package and for Version 5. Both versions are available for download.

4.2 Enhancements

A number of changes to the capability of the version 5 programs were implemented. Even so, the redeveloped suite of programs maintains the same look and feel as the previous version.

At the request of users in the Northern Territory and consultants undertaking a survey of breeder mortality in northern Australia for MLA, a number of age groups were added to the breeder age groups in both the Breedcow and Dynama worksheets, allowing cows up to 15 years old to be included in any analysis.

Other minor changes including the way females surplus to requirements are described, the way the adult equivalent rating of spayed or surplus cows is calculated and the maximum age that steers can be retained were also incorporated after feedback from users.

A request was received to develop a process to allow the easy importation of data files and analyses developed in version 5 into the new suite of programs. Unfortunately, the differences in programming structure between version 5 and 6 has prevented this from being implemented to date.

4.3 Project roadshow

The functionality of the new programs was demonstrated to select staff located in Townsville, Charters Towers, Mackay, Emerald and Rockhampton during mid 2012.

A clear message from a variety of users at these initial workshops was that the road show and training program required to meet milestone 6 should focus more on answering real world questions with the software package than just simply a demonstration of the suite of programs.

In the original project agreement, the ‘training’ aspect of milestone 6 was intended to ‘train’ new and experienced users in the functionality of the upgraded software. We had not intended to deliver a series of applied workshops using industry data with an experienced economist(s) leading various Breedcow and Dynama modelling scenarios.

As a result of the requests from users of the software, a series of workshops that focussed on herd modelling and beef economics were undertaken across northern Australia. The Breedcow and Dynama suite of programs were used to analyse scenarios of interest to participants, providing them with an insight into their use.

Topics covered at the workshops included the economics of:

- wet season phosphorus nutrition;
- age of turnoff in steers;

- breeder reproductive efficiency;
- developing stylo pastures;
- land condition;
- dry season supplementation;
- turnover steers;
- developing leucaena;
- optimal stocking rates in arid lands; and
- responding to short term opportunities or crises.

Other topics covered in detail included how a herd model or livestock schedule can be constructed and the role of Adult Equivalents or Livestock Units in herd modelling.

These workshops were initially delivered in the Northern Territory in both Katherine and Alice Springs in late 2012. They were combined with other activities that examined options for northern beef producers if the live export market failed or was further reduced. Of particular interest in this exercise was the potential impact of the establishment of an export abattoir near Darwin.

The analyses undertaken in the Northern Territory also contributed to a project led by CSIRO that examined changes to beef cattle logistics due to changes in markets. The assessment of options was undertaken with the Breedcow and Dynama suite of programs by Dr Sandra Eady of CSIRO. Dr Eady is a Principal Research Scientist in CSIRO Livestock Industries based at the FD McMaster Laboratory in Armidale, New South Wales.

Workshops were also delivered to departmental staff and industry representatives in Longreach, Mt Isa, Brisbane, Rockhampton and Charters Towers. Any additional expenses associated with the delivery of the workshops were met within the existing project budget.

The delivery of training workshops more broadly to industry participants is planned to occur over time as resources become available.

An evaluation of user satisfaction with the reprogrammed Breedcow and Dynama software and the workshops was undertaken. All participants were provided with access to an internet based questionnaire developed by DAFFQ staff. The results of the evaluation are presented within the appendix of this report.

The general response was favourable with participants rating the presentation and conduct of the workshop a 6 out of 7. A number of suggestions for improvement were also received.

5 Discussion/Conclusion

The project has met or exceeded its targets including the key objective of maintaining the capacity to further develop the software as needs arise. Although we believed the software and its processes to be relatively complete and stable prior to the project, it soon became apparent that experienced users continue to find additional processes they would like included. The availability of the Microsoft Excel version of the programs provides a useful link to the future for the suite of programs and allows development to occur as required.

The critical role of herd modelling and beef economics in the formation of soundly based plans and production choices being made by beef industry participants has not diminished. Neither has the capacity of the Breedcow and Dynama suite of programs to underpin such decisions with rigorous and conceptually sound processes. Even so, there does appear to

be a gap arising in the ability of industry to access suitable training in the skills that underpin effective and rigorous decision making.

The Breedcow and Dynama software package has previously been a key component of training courses offered to the north Australian beef industry. These courses provided participants with insights into budgeting methods to improve beef cattle enterprise profitability and financial management. The training also demonstrated rigorous ways of looking at herd and property business decisions, utilising the Breedcow and Dynama software to apply these methods.

We believe it is critical that courses /workshops designed to train industry in the skills that underpin effective decision making remain a focus of RD&E funders and Government agencies. The Breedcow and Dynama suite of programs are seen as a critical component of this process for north Australian beef producers.

It is also essential that the software engineering capacity within DAFFQ is maintained. This will allow the continuous improvement of the suite of programs as the need arises.

The Breedcow and Dynama software package is available at:
http://www.daff.qld.gov.au/16_6886.htm

6 Appendices

6.1 Appendix 1 Workshop evaluation questionnaire

Beef modelling and beef economics workshop

Evaluation Questions 2012-13

Host property/location: _____

Date: _____

1. Please tick your participant category

- | | |
|---|---|
| <input type="checkbox"/> Beef producer | <input type="checkbox"/> Government dept (Please Specify _____) |
| <input type="checkbox"/> Community group | <input type="checkbox"/> Agri-business/banker |
| <input type="checkbox"/> Other - please specify _____ | |

2. Overall, how useful did you find this activity?

	1 (Not at all)	2	3	4	5	6	7 (Extremely useful)
The usefulness of the workshop overall							
The information provided							
Livestock schedule and beef enterprise analysis							
Herd modelling							
Breedcowplus							
Dynamaplus							
Cow trade and Bullocks							

3. In what ways do you plan to use the skills gained in your situation in the next 6 – 12 months? (Please indicate likelihood)

	1 (Not at all)	2	3	4	5	6	7 (Extremely likely)
I plan to analyse potential on-property practice change							
I plan to look at turnoff options (market options etc)							
I plan to forecast business decision changes, e.g., impact of improved genetics							
I plan to conduct cost-benefit analysis of property infrastructure projects							
I plan to conduct cost-benefit analysis of herd improvements (productivity assessments)							
I plan to conduct herd diagnostics							
I plan to analyse trading options							
I plan to determine cost-benefit of R&D investment							
I plan to use the Breedcow Beef CRC templates to conduct industry analysis							

4. How confident are you to use Breedcow Dynama in your situation in the next 6 – 12 months?

(Please indicate confidence level)

	1	2	3	4	5	6	7
How confident are you in using this program without assistance?							
How do you rate the user-friendliness of this version							

Comment _____

5. Do you think the program can be further improved?

Yes No

If the answer is yes, how can it be improved?

6. If you were presenting this workshop what would you do differently?

Comment _____

6.2 Appendix 2 Workshop evaluation responses

Questions 1-4

	Score			Median (middle)	Mode (most common)
	Average	Minimum	Maximum		
The usefulness of the workshop overall	6	4	7	6	7
The information provided	6	4	7	6	7
Livestock schedule and beef enterprise analysis	6	4	7	6	7
Herd modelling	6	4	7	6	6
Breedcowplus	6	4	7	6	6
Dynamaplus	5	1	7	5	5
Cow trade and Bullocks	5	1	7	5.5	7
I plan to analyse potential on-property practice change	5	1	7	5.5	7
I plan to look at turnoff options (market options etc)	5	1	7	4	4
I plan to forecast business decision changes	4	1	7	4	7
I plan to conduct cost-benefit analysis of property infrastructure projects	4	1	7	4	4
I plan to conduct cost-benefit analysis of herd improvements (productivity assessments):	5	1	7	5	7
I plan to conduct herd diagnostics	4	1	7	4	4
I plan to analyse trading options:	4	1	7	4	4
I plan to determine cost-benefit of R&D investment	4	1	7	4	6
I plan to use the Breedcow Beef CRC templates	5	1	7	6	7
How confident are you in using this program without assistance?	5	1	7	5	6
How do you rate the user-friendliness of this version	4	1	6	4.5	5

How confident are you to use Breedcow Dynama in your situation in the next 6 at 12 months? (Please indicate confidence level): Comments

Confident to use Breedcow but feel that the spey information input tables in Prices and Huscosts should be moved in the spreadsheet layout to improve user friendliness. Dynama seems to be suffering from a number of complaints at this stage of transition. Should I need to use Dynama in the near future I will use the original suite of BCD. I'm sure we will be advised when the new Dynama is 'good to go'!

Practice is the key - as you get into the plus sections there is more data and I would not be confident in my ability to get it right enough to show a business

I am not an overly confident person. I am also slow to learn. To use this program as it is intended I will have to practice with it first which I intend to do.

Still need assistance from more experienced people to check that my assumptions and output make sense The version we used at the workshop was still full of bugs/mistakes so we weren't able to do as much as later groups have been able to.

We did not spend much time on Dynama at the workshop.

I wish it could be more user friendly for the top 20% of producers.

The key aspects I got out of the days were a revision of the economic modelling. The discussion on key aspects of the industry and how that will affect my interaction with producers. I hope I can use the increased knowledge to explain the concepts to producers and head them in the correct direction to access assistance.

Thank you. I need to get in and use it again quickly tho!! It all makes sense once using it (but when I went through the questions above on each activity, I had to really think hard as it all flows into each other and I had trouble distinguishing which was which in my memory!). I look forward to our group getting together and throwing some figures around and coming up with other specific herd structures for different country types (eg Mitchell, Mulga, Channel, desert uplands) - not only will that be really useful but it will make me re-visit the process again. Thank you for coming out here to run one!

Do you think the program can be further improved?

If the answer is yes, how can it be improved?

Improve layout of Prices and Huscosts in Breedcow - specifically by moving the cull bull section to the end of the cow section i.e. before the spey female table. To me it makes sense that all the breeding part of the enterprise (females and bulls) is located together and the growing and turnoff part of the enterprise, males and speyed females, are located together. The layout in Huscosts would also benefit from a similar change by including the bull costs immediately after 'Cows 3 years+ sold' and include the speys either as separate table or include at the end of the male costs.

On-going Quality and Assurance

I don't know but to say NO in cannot be improved seems to suggest its perfect and that does not seem possible.

Iron out the bugs!

With time the bugs will all be sorted out.

I believe the manner/timing in which the calves born to heifers is confusing/misleading.

It is difficult to get to teaching the mechanics of the model when some participants are still getting their heads around what GM is.

Removal of the formatting errors.

Sort up the down load issues.

More user friendly is the priority to improve uptake.

I still think it can be a bit more user friendly. I would prefer to see where all the values from the Preg test function are so that you can manually edit them later.

Not sure will need to spend some time reflecting

I should just go back and click no to make it easier!! I always think things can be improved but I am not much good at telling you how! I need to use it some more as I know when going through it, we can think of ways to make it easier ...(I think we came up with a few in the workshop). I will make notes when I use it again...It is good tho! and easier than when I last used it in about 2007!!

If you were presenting this workshop what would you do differently?

Leave out the Dynama section or use the old system to demonstrate its use - temporary necessity I'm sure!! When sorted spend more time on the Dynama section to demonstrate its use as a tool to identify the implications of e.g. drought management sales of different classes of cattle; the cost benefit of P supplementation where the full responses to supplementation are not likely to be apparent for several years after the implementation of the practise; similar exercise with pasture/land development as we did with the Style story.

Don't spend time debating the figures from the NSW demo. The goal is to show how you can work through the system. time spent debating the goldfields scenario was useful. Problem with dragging it out is that you spend a considerable amount of energy and grey matter on the figures and have less for actually understanding how the program works.

Wouldn't change a thing. Presenters very passionate about their product and how it can be used to help people all throughout the beef industry.

Have versions of the software that work properly before doing the workshops. We ran out of time because there was a lot of discussion. Whilst the discussion was useful, perhaps needed to keep the workshop moving along a bit.

Very happy with process and content of w'shop

Nothing - very good, informal approach that addresses users key issues

Not much. People were given GM in advance to think about. Probably people need to do more homework themselves before they come along. i.e. understand the layout of the Breedcow template so they can see what contributes to a GM.

Presenters did exactly what we needed.

I know we played with the figures a bit when we did the workshop here - I just wonder if it would be good to take time to really nut out and discuss some of the figures for a local herd structure (for staff workshops). It would be helpful as it really makes us think more about what each figure means and how it feeds into the rest of the program. This might add too much time - I can definitely see the advantage in having the figures already there (especially in a producer workshop)! Overall presentation was great tho.

Delivery format of herd modelling and beef economics workshop

This program is normally delivered as a 2 consecutive day workshop. What delivery options should we consider? For example, two one day workshops conducted at different times.

I think the breedcow suite needs at least a day and a half but maybe that is a good time to send participants home with a bit of homework or to model their own herd or something with a view to coming back say a month later for another day and a half to sort out any Breedcow issues (half a day) and spend a day in training/demonstration of Dynama and associated financial analyses. The financials are a whole new world which I feel many producers and staff find particularly challenging - especially in the last couple of hours of a 2 day workshop!

I am not sure the average producer is at the stage of being able to use the full version. May have more interest in doing short sessions on cowtrade and bullocks and then the keen ones can come back after a time doing that and learn about the full version. 1/2 day session on those would be a good start and more chance of appealing to a wider audience.

Think it is good to do it in one hit so you get familiar with the processes. An on-line self-training option might be good in addition to the workshop (which was a good format for people new to the program like me).

2 one dayers with commitment to go away and use.

Whatever will get more people engaged. Will no doubt need multiple delivery platforms.

Perhaps some facilitated on-line training as an introduction. We have used this a lot for Life Cycle Assessment training and it gives people the time to get up to speed before investing in more detailed face to face training sessions.

I think that the 2 consecutive days would be more appealing to most people. Although it is a lot to cover in two days I think for convenience it would be better for people to set aside two consecutive days then to try attend one day workshops at different times.

The one day workshop for consultants should suit most.

Keep it as two days - too much to absorb in one day.

Two consecutive days is good - I wonder if it would be useful for some pre-work in this instance - eg pre-workshop questions on typical weaning weight etc etc...to itemise out some of the figures we would be chasing but presented just as a list to get us thinking and

focussing... Having said that, it would still only be a few people who could answer them outside the group - I would go running off to others for the answers anyhow - but it might get us thinking.

General presentation and conduct of the workshop

Average	6
Minimum score	4
Maximum score	7
Median (middle) score	6
Mode (most common) score	7