FutureBeef NORTHERN MUSTER *Information for rural business in North Queensland* Queensland Government

A decade of beef research at Spyglass

A LOT has changed since Stephen Anderson moved to Spyglass when the Department of Agriculture and Fisheries bought it 10 years ago.

Once home to two commercial cattle properties - Lucky Break and Spyglass - the 38,300-hectare property has been transformed into a state-of-the-art research facility dedicated to increasing productivity and profitability for Queensland's beef producers.

As the manager of Spyglass Beef Research Facility, Mr Anderson has been instrumental in its journey.

"When my wife Angela and I moved here, there was nothing but a house with one set of yards and with minimal infrastructure for a research operation," Mr Anderson said.

"Spyglass is about 110 kilometres north of Charters Towers and 130km west of Townsville, so we had no internet or anything like that.

"Our first priority was to build offices and accommodation quarters for staff and researchers.

"We built five houses, rebuilt the existing homestead and put in some sheds.

"Over the years, we have built two sets of cattle yards, installed up to 300km of fencing, cleaned out 15 dams, set up 30 water tanks gravity feeding to 70 troughs and purchased associated machinery to operate a research facility.

"We also brought in fibre-optic cable to secure internet coverage needed to operate as a research facility.

"Spyglass is now home to eight staff and their families, with some of our kids raised here. We're a really close-knit team and we've worked together to make Spyglass what it is today."

Mr Anderson said research carried out at Spyglass would increase productivity and profitability for the state's beef producers by addressing beef cattle genetics, reproduction, nutrition, growth, welfare and husbandry.

"Key examples of this are ongoing identification and validation of improved beef cattle genetics," he said.

"Others are investigations into the causes of and solutions for reproductive inefficiencies such as embryo and newborn calf loss.

"We run about 3300 Brahmans and Droughtmasters here, with some used in the Repronomics trial.

"We also supply cattle to other trials - such as those run by the CSIRO and at DAF's other research stations."

The research facility is set up for long-term monitoring, enabling researchers to analyse and validate the impacts of grazing strategies and climate change on pasture and animal production, landscape condition and business performance.

Cattle being processed in the new Continong Outstation yards at Spyglass.

Graziers inspect the new legume trial during a recent paddock walk.

Legume trial sown at Spyglass

AN 80-HECTARE dry land replicated trial of perennial legumes and pastures was sown at Spyglass Beef Research Facility this year.

The trial will test three commercially available pasture-legume systems - leucaena, desmanthus and stylosanthes - alongside a grass pasture-only system.

It will investigate and compare the establishment, management and economic benefits of grass-legume systems in the Charters Towers region. Since planting, good rainfall has been recorded across the site.

Once established, this project will provide an excellent site to sustain small-scale grazing trials and test live weight gains of animals.

It will also be a demonstration-ready site for extension activities for the northern beef industry and provide an additional high-quality feed source to improve the productivity of the Spyglass commercial beef cattle herd.

Karl McKellar, senior extension officer, DAF Charters Towers, 0418 189 920.

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Breed research delivers

SPYGLASS Beef Research Facility is playing a pivotal role in a world-class research project for the northern beef industry.

Low weaning rates have long been recognised as a limiting factor to enterprise productivity in northern Australian beef herds.

Many environmental and management influences can affect this, however, it has been shown that genetics play a crucial role.

The University of New England, Animal Genetics and Breeding Unit, Department of Agriculture and Fisheries (DAF) and the Northern Territory Department of Primary Industries are exploring this further with the Repronomics project.

The project began in 2013 with funding from Meat & Livestock Australia (MLA) and more recently from the MLA Donor Company, using the Northern Territory and Queensland governments' beef cattle research facilities.

Repronomics operations manager Tim Grant, of DAF, said the project was developed to harness the findings from the Beef Cooperative Research Centre for Genetic Technologies and deliver enhanced selection opportunities to improve productivity traits, including those related to female fertility.

"Spyglass Beef Research Facility has been integral in providing a population of well-controlled, specifically-managed cattle that can be accurately recorded for economically important traits, including precise birth dates," Mr Grant said.

"The scale and associated infrastructure of Spyglass has allowed for this critical mass of animals to enable a project of this precision and magnitude.

"The cattle within this project are possibly the largest, most evaluated herd of tropical cattle in Australia, with generations of intensive recording in their pedigree.

"At the core of the Repronomics project is the precision design to enable a reference population of benefit to the wider industry.

"To achieve the greatest influence in the northern beef herd, the project has sourced industry-relevant genetics each year through regular attendance at stud stock sales and the sourcing of semen from highly influential bulls from within the three breeds being evaluated - Brahman, Droughtmaster and Santa Gertrudis."

Mr Grant said the Repronomics project had generated progeny from more than 450 sires so far.

"At Spyglass and Brian Pastures, where multiple breeds are run, these breeds are run together, head-to-head, which will in the future allow for individuals from the different breeds to be compared directly with each other in a multi-breed analysis," he said.

"This will provide greater power of selection to those using a cross-breeding program in their business.

"Key to the project is recording female reproduction by monitoring the female reproductive tract using ultrasound to capture the age at which puberty is reached, the interval from giving birth as a first-calf cow until resumption of cycling and the calving outcomes from natural mating.

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>
> **Tim Grant, DAF Repronomics operations manager**

"Other heritable traits are measured along the way, including gestation length, growth and ultrasound carcass measurements."

Mr Grant said the steer component of each year's calf drop was provided to the MLA Donor Company-funded Northern Beef Information Nucleus Steer Project, which was managed by the Australian Brahman Breeders' Association, Droughtmaster Stud Breeders' Society and a consortium of Santa Gertrudis breeders.

"These steers were followed through backgrounding and finishing, with data collected on post-weaning growth, carcass and meat quality traits," he said.

"All animals within the project are genotyped and parentage verified through DNA analysis.

"Being able to align the production phenotypes (observable characteristics) to an individual's genotype has enabled significant improvements in the accuracies of estimated breeding values (EBVs) through the recent introduction of single-step genetic analysis in Breedplan.

"Single-Step Breedplan is a new genetic analysis where the pedigree, performance and genomic information is processed and analysed all together.

"Increases in the order of 40 per cent have been seen in the accuracies of the days to calving EBV in animals which have only been genotyped.

"This gives producers greater confidence when selecting new genetics and the subsequent performance of the progeny generated.

"This technology also allows seedstock breeders to improve the product they are breeding more accurately and rapidly."

Mr Grant said with continual accrual of data through intensive monitoring, other significant industry questions were also being quantified, including the factors affecting calf losses and calf survival.

"Although genomic technology provides great benefits to industry in describing the genetic merit of animals and their future progeny, a core base of accurately performance recorded animals will be required to stay relevant as population genetics change through selection over time," he said.

"It is envisaged this core base of animals will expand into other tropical breeds to exponentially increase benefits to the northern beef cattle industry."

For more information call Mr Grant on 0475 953 746.

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Low colostrum poses a risk

IN RECENT research with Brahman and Droughtmaster cows in multiple situations, only two thirds of newborn calves received enough milk to grow at the expected one kilogram per day from birth.

Milk delivery was measured by change in live weight and circulating blood immunoglobulin concentrations in 250 calves at Spyglass Beef Research Facility and Fletcherview Research Station.

A third of newborn beef calves barely received enough milk to maintain themselves and full milk delivery enabling high growth did not begin until about three days after birth.

This is a common problem in easily measured mammalian species, including humans. But this research demonstrates and defines the problem in extensively managed beef cows.

Jarud Muller, of DAF, (left) and Geoffry Fordyce, of QAAFI, conduct colostrum delivery research.

Current research shows that diet quality in the weeks before calving - and its impact on changes in hormone levels - has a big impact on the ability of a cow to start full lactation at calving.

From the moment the calf leaves the safe in utero environment at birth, its only source of hydration and sustenance is the first milk, colostrum. Colostrum is the lifeline to surviving the first week, which is the highest-risk period of calf life.

Our evidence is that delayed lactation in cows may explain the link between poor cow pre-calving nutrition and high calf mortality rates.

The Meat & Livestock Australia (MLA) Cash Cow project monitored 78,000 breeders on 72 commercial beef properties and found a quarter of them experience calf wastage (losses between confirmed pregnancy and weaning) of 15 per cent or more.

While calves in this research at Spyglass and Fletcherview were closely monitored under low-risk conditions, any further risks to timely milk delivery, which is not uncommon in commercial situations, would likely lead to calf dehydration and ultimately mortality.

Failure to deliver adequate colostrum to a newborn calf can result in mortality within three days, or as little as one day under hot conditions.

To minimise milk delivery failure to newborn calves, recommendations based on current evidence are to ensure late-pregnant cows are in at least moderate condition and provided with key nutrients such as protein and phosphorus.

Other important practical considerations to help timely lactation include reducing distance to water and ready access to pasture.

Calf Alive, a new MLA Donor Company project starting soon, will test ways to sustainably minimise calf wastage on commercial beef properties.

▮ Jarud Muller, scientist (animal production), Department of Agriculture and Fisheries, Charters Towers, 0450 860 948.

TOOL FOR MEASURING BREEDING HERD PRODUCTIVITY UNDER THE MICROSCOPE

AN INVESTIGATION is underway at Spyglass Beef Research Facility to validate the Meat & Livestock Australia Cash Cow project's theory that a breeding cow's productivity (kilograms weaned per cow) should be at least that of annual yearling steer growth (kg per steer) when grazing the same pasture.

Without a simple and reliable method for assessing breeding herd performance, there is the possibility that unrealistic expectations are placed on herd performance. This could result in unnecessary and costly changes being made.

During this investigation, which began in 2016, up to 15 yearling steers were grazing with a mob of 300 mature cows throughout the year. The following measurements were taken to assess whether steers could be used to assess breeding herd performance:

- cows retained after pregnancy testing
- weight and number of calves weaned
- annual weight gain of the steers.

From these measurements, the annual live weight gain of the steers was calculated, as well as the average live weight produced per cow. Results seem to confirm that yearling live weight production is a reliable estimation for potential cow live weight production (kilograms weaned per cow retained) thus providing a target for breeding businesses.

So, if your cow herd is producing at least as much live weight as yearlings would do under the same grazing conditions, your breeding herd's production and performance is doing ok.

▮ Ian Dunbar, technical officer, Department of Agriculture and Fisheries, Charters Towers, 0436 849 348.

FAST FACTS

- Cash Cow project found weaner production a useful indicator of cow productivity.
- Weaner production should be the same or better than yearling growth under the same grazing conditions.
- Weaner production is calculated by (calves weaned/retained cows) x average weaner weight.