



At a glance

Native to the Gulf of Carpentaria, redclaw is a species of freshwater crayfish farmed commercially in northern Australia – a fledgling industry worth about \$1 million annually.

Growers in central Queensland first started to farm redclaw in the late 1980s, attracted by the animal's fast growth rate, relative ease of breeding and adaptability to varying water quality.

However, despite some initial success, the redclaw industry soon ran into difficulties due to widespread inbreeding, resulting in a significant proportion of redclaw which were too small to market. The problem was identified as a lack of genetic diversity within individual redclaw operations – with a high degree of sibling inbreeding.

In 2007, industry participants supported by RIRDC funding partnered with James Cook University to implement a breeding program to develop a fast-growing, disease-free redclaw that would overcome the inbreeding issue.

The breeding program has been highly successful and the industry is now well placed to expand and take advantage of a growing market demand for its unique, premium product.

Fact Box

- Redclaw is viewed as a premium product, competing with scampi and bay lobsters.
- About 60 per cent of Australian redclaw is currently sold within Queensland and 10 per cent sold interstate, with the remaining 30 per cent exported, primarily to Hong Kong.
- Redclaw is commonly marketed in size grades of 20 gram variance. The 30 to 50 gram range is cheaper and used in buffet-style presentations. The larger animals in excess of 120gm are the most lucrative and feature in a-la-carte restaurants.

Research and Development

Redclaw research projects are funded by the RIRDC Animal Industries R&D Program, which aims to accelerate the development of new animal industries with potential competitive advantage in Australia. Research for this industry has been focused on genetic improvement of the commercial redclaw population, and on development of feeding standards to optimise crayfish growth rates.

The genetic improvement project started in 2007 and has culminated in the development of a superior strain of redclaw known as the Tolga, which can achieve

a growth rate 50 per cent higher than previous commercial populations (see case study).

Because food and labour costs account for the majority of expenses incurred by intensive aquaculture operations, efficient, productive and cost-effective feeding regimes are also critical to the success of the redclaw industry.

Little is known about redclaw nutritional requirements, and current research is focused on developing feeding standards and feed types to optimise the growth rate of the Tolga strain. The aim is to develop

a better understanding of the nutritional needs of redclaw at different growth stages, and in particular its protein, lipid, vitamin and mineral requirements. Also being examined is the optimal pellet size, the water stability of various feed types and the impact of feeding regimes on growth rates and farmer time.

The nutritional research will also attempt to quantify how much natural feed the redclaw consume within the commercial grow-out ponds, and whether locally-available feed sources could be relied upon to supplement commercial feed pellets.

INDUSTRY CASE STUDY

Redclaw breeding hatches new industry direction

A genetically superior redclaw strain and a centralised hatchery system are set to stimulate the growth of the fledgling redclaw crayfish industry in northern Australia and potentially increase profits by as much as \$20,000 per pond-hectare.

The new strain, known as the Tolga, is the culmination of a five-year RIRDC-funded research project run by the redclaw industry in partnership with James Cook University.

Principal researcher and commercial redclaw producer John Stevenson says the Tolga incorporates the best genetics from 11 different redclaw populations. "The new strain is the result of a specialised breeding system in which commercial operators were responsible for developing a distinct redclaw pedigree that was then crossed with other pedigrees to produce the Tolga," Mr Stevenson explains.

As part of the project, redclaw eggs from each of the crosses were incubated in a hatchery system adapted from Europe. The incubator provided controlled growing conditions and enabled the production of disease-free stock, which was then delivered to the commercial pond operations for growing out.

"The hatchery system was so successful in generating consistent batches of disease-free redclaw that it was decided it should be integrated into a new mode of operation for the redclaw industry," he says.

Before the central hatchery system, commercial redclaw producers relied solely on their specific population of redclaw for breeding and producing saleable crayfish. But this soon led to serious levels of inbreeding, loss of productivity, and diminished crayfish quality.

Under the new system known as S3J Farming (Stage Three Juveniles), commercial redclaw operators buy batches of juvenile redclaw to stock their grow-out ponds.

The hatchery supplies animals of known quality and can do so all year round, allowing maximum use of the premium growing season.

"With the S3J Farming system, ponds can be stocked with animals all the same age on the same day, eliminating the issue of larger animals out-competing smaller animals for feed," Mr Stevenson says.

As growers know exactly what they are putting into their ponds, the biomass of the pond is calculable at any time, making management easier.

The new system also significantly cuts transport costs. Previously, redclaw used for stocking ponds were

"The hatchery system was so successful in generating consistent batches of disease-free redclaw that it was decided it should be integrated into a new mode of operation for the redclaw industry"

transported when the animals reached about five to 10 grams - the size at which they could be harvested easily. But young redclaw grow very quickly and were often moulting while being transported, making them vulnerable to crushing. Using the old system a maximum of 500 redclaw could be packed in a box with relative safety.

By comparison, under the S3J Farming system, animals for stocking ponds can be transported once they reach just 0.02g. This means as many as 10,000 redclaw can be packed in a bag of oxygenated water and comfortably survive a transport period of 50 hours with no appreciable losses. "The S3J system has cut the industry's transport costs by a factor of twenty."

Natural range of redclaw in Australia



Natural range of redclaw in Australia

Source:
www.nt.gov.au

Contact RIRDC

Phone: 02 6271 4100

Email: rirdc@rirdc.gov.au

Web: www.rirdc.gov.au

Pub. No. 13/O66