LIVESTOCK THRIVE

Former ACIAR project leader Max Shelton reports on the progress, five years on, of an ACIAR-supported project that he and his team completed in 2000 to lift the quality and use of leucaena for feeding cattle and goats in Papua New Guinea, the Philippines, Vietnam and Thailand

In the Philippines, leucaena (called ipil-ipil locally) has long been an important feed source for cattle and goat production. Its growth, however, has been limited by the psyllid insect, which arrived in the mid-1980s. This affects leaf production when it is most needed in the dry season. The severity of the psyllid challenge has abated somewhat in recent years although leucaena is still attacked early in the dry season when it is most needed.

Nevertheless, leucaena remains a major source of high protein feed for ruminants in the Philippines.

In the late 1990s, with our Bureau of Animal Industry collaborators, we introduced our new hybrid KX2 leucaena for testing by the villagers at Mabini in Batangas Province.

On this return trip, I met Mariano Bautista, president of the Farmers' Association in Mabini, and his friend Gaudencio Manebo. They have successfully grafted KX2 scions onto existing leucaena trees in their fields. Mariano now has more than 300 KX2 trees, while Gaudencio has more than 500 trees. They use them to feed goats.

Mariano has five breeding does and about 15 goats overall. He attributes the frequency of triplets to the high amount of KX2 leucaena in diets. Both farmers have become convinced of KX2's superiority over ipil ipil. It is resistant to psyllids, its growth is better than the local variety, and they say it can be cut at least twice for every one cut of ipil ipil. KX2's wood yield is also higher; an important factor due to the need for a year-round supply of fuelwood for cooking.

Adoption by farmers where the project team worked has been excellent, but the spread of the technology to other villages and regions will be slow – the hybrid must be vegetatively propagated, and support and training for propagation nurseries and extension services is inadequate.

I also visited Cebu Island, an island province with about 3.5 million people. Cattle and goats are major livestock industries with increasing demand from urban consumers. Consequently, livestock fattening is an important income stream.

Leucaena was first introduced in 1977 as part of a Philippine-wide program to help rural communities. Incentives were introduced to promote multi-purpose tree planting. For instance, no one was allowed to marry, or graduate, unless they planted trees, and these were often leucaena trees.

More than 1000 smallholders in the village of Dabayaag adopted ipil ipil, but because of the psyllid problem, *Leucaena diversifolia* was introduced to the village by Larry Fischer, working for World Vision, in the mid-to-late 1980s. Farmers now collect seed of *Leucaena diversifolia* for on-selling to other farmers. Since the new species was psyllid-resistant, it solved a feed gap and was immediately adopted.

We spoke with farmer Benigno Alcarzaren, who had just produced nine kilograms of *L. diversifolia* seed for sale. He feeds cattle *L. diversifolia* with a mixture of corn bran, plus some coconut meal, to fatten them. He aims to buy cattle at 200 kilograms and in four months lift their liveweight to about 300kg. These weights are all estimates, as there are no scales.

In another village on Cebu (Balaygtika), more than 80 per cent of 800 households fatten cattle on traditional ipil ipil leucaena. Victoria Casipona and her family daily feed a mixture of chopped ipil ipil and melina (*Gmelina arborea*) leaves, plus corn bran to fatten bulls bought at the local market. The bulls are bought at around 300kg liveweight and fattened for two to four months and sold. The bulls do well on this diet, which she also believes controls intestinal worms.

KX2 was even more also successful in Vietnam, where there is less of a history of leucaena use in ruminant feeding systems. However, smallholders are similarly dependent on sale of livestock products for income, and the KX2 leucaena offered a cost-effective protein supply.

The fertile Moc Chau Plateau in Son La Province is about 200 kilometres west of Hanoi and has a thriving dairy industry, supplying fresh milk to the Hanoi market.

The smallholder dairy farmers at the Moc Chau Milk Company said that cattle find KX2 leucaena palatable and there is no problem with the taste or smell of the milk. When they feed 5kg of fresh KX2 a day per cow (10 to 12 per cent of diet), there is an increase in milk yield (one to three litres a day), butterfat percentage and milk density. They said that KX2 produces forage year-round and does not frost in winter like the grasses.

Mr Hoang Minh Duc, in Moc Chau District, has 15 Holstein Friesian cows, and he feeds them elephant grass, 4kg to 6kg concentrate (minerals, maize bran, rice bran, soybean, promix) per day, and KX2. At the moment he has 400 square metres of KX2 but he wants to expand this to 2000 when KX2 cuttings become available. He can increase milk yield by about two litres a day to 18l/d in winter and 20l/d in summer by feeding KX2 leucaena. The Vietnamese

LEARNING BY EXPERIENCE

Each year, 40 to 50 ACIAR-funded projects are completed, but ensuring that benefits continue beyond an assignment's life remains a challenge. Successful projects impart knowledge and skills and leave in place technology that is sustainable in the long term under local conditions.

Looking back at large projects, three to four years after completion, helps evaluate and highlight uptake levels and project results. ACIAR carried out and published the first of these adoption studies in 2004. A second compilation has just been released, *Adoption of ACIAR Project Outputs*, which looks at projects completed in 2000 to 2001. From the lessons learnt in these studies, ACIAR hopes to improve its future efforts and provide direction for subsequent economic impact assessments. Gaining insight into research selection and management practices also helps ACIAR decide on future research directions and priorities.

For copies of the report contact comms@aciar.gov.au.

ON TREE HYBRID

SEVERAL LARGE RANCHES IN THE MARKHAM VALLEY ARE BEGINNING TO USE LEUCAENA-BASED GRAZING SYSTEMS, DUE TO THEIR HIGH PRODUCTIVITY

Left: Victoria Casipona and her family daily feed a mixture of chopped ipil ipil (leucaena) and melina (*Gmelina arborea*) leaves, plus corn bran, to fatten bulls bought at the local market.

Right: grafted KX2 trees.

team, through their links with the Forest Research Institute nurseries, have produced more than 50,000 rooted cuttings without difficulty. Nevertheless, continued support for training and extension services will be necessary to ensure continued adoption and realisation of the full potential of KX2 leucaena.

In Papua New Guinea, several large expatriate-owned company ranches in the Markham Valley are beginning to use leucaena-based grazing systems, due to their high productivity and robustness under grazing pressure.

The success of the cultivar Tarramba, originally released in 1997, has lifted the potential for ruminant production in the Markham Valley. This has led to almost 1000 hectares being planted by the company-owned cattle properties that service the live cattle export market to the Philippines and Indonesia.

At Markham Farms, manager Scott Young has 400ha of existing leucaena and has just planted a further 50ha. When he arrived to take up his position with the British-owned property, he found that 40ha of leucaena planted in the late 1990s had been abandoned and allowed to grow tall. Although he was advised to bulldoze the area, Scott cut it back and he is now feeding 600 cattle on the area for much of the year. He finds that he needs this high stocking rate to control leucaena's rate of regrowth in this favourable environment (plenty of water, heat and fertile soil). Leucaena plus some inter-row grass is the main pasture feed supply, although he says it is hard to find a grass that can survive these high stocking rates.

Scott says that the leucaena has given him the confidence to expand the operation. He now plans to increase his leucaena area by 100ha a year for next five years.

His strategy is to plough strips and plant double rows of leucaena at 10-metre centres, saying that the wide rows will give grass a better chance to survive the high stocking rates, and it will give him better control over the leucaena.

Livestock raising for beef and milk has also become popular in north-eastern Thailand. In the past, cattle were mainly used as draft animals and were poorly fed with rice straw. Now, with a strong economy and strong demand for beef and milk, cattle are worth a lot of money. There is insufficient feed for these intensively raised cattle so some farmers (those with irrigation) have grasped the opportunity to become specialist grass growers. There is opportunity to expand the use of leucaena in north-eastern Thailand as it grows naturally in many districts, however due to high demand for forage by cattle farmers, improved grass plantings are currently high priority. ◂

Max Shelton is an associate professor at the Faculty of Natural Resources, Agriculture and Veterinary Science, University of Queensland.

CONTACT: Max Shelton +61 7 3365 2541, m.shelton@uq.edu.au