

Twin sowing for more profitable pastures

Twin sowing – a new technique for sowing legume pastures using hard seed undersown with a cereal or oil seed crop – could substantially reduce costs of pasture establishment for Australian growers.

Dr Angelo Loi and Brad Nutt of the Department of Agriculture and Food WA (DAFWA) developed the technique to encourage the continued use of pasture legumes in mixed farming systems.

Angelo said incorporating a legume based ley rotation provided many agroeconomic benefits in a mixed farming system, but grazing livestock had lost economic value relative to crop production in low and medium rainfall areas.

The research has been funded by Pastures Australia, which is supported by the Grains Research and Development Corporation (GRDC), Australian Wool Innovation (AWI), Meat and Livestock Australia (MLA), Dairy Australia and the Rural Industries Research and Development Corporation (RIRDC).

Pastures Australia Manager, Rory Coffey, said early results indicated twin sowing might be an effective technique to intro-

duce hard seeded pasture legumes in a crop-pasture ley rotation.

"It has the advantage of not requiring a separate sowing operation and not conflicting with the cropping program in terms of timing of sowing," he said.

"It also provides pasture legumes with the opportunity to utilise the full growing season.

"An essential feature of the twin sowing technique will be on-farm seed production of the pasture legume because of the sowing rates required," Rory said.

Angelo indicated that yellow serradella and hard seeded forms of French serradella from pods produced on-farm could be undersown with a cereal or oilseed crop.

"Seeds in these pods are almost 100 per cent hard and little germination occurs under the crop," he explained.

"In the summer and autumn following the crop, the hard seed will break down to form a seed pool that will germinate if conditions are favourable.

"The serradella will establish as a regenerating pasture from this pool, which avoids the time and cost of a separate sowing operation," Angelo said.

Rhizobial inoculants

A second essential feature of twin sowing is the successful introduction of rhizobial inoculants with the hard seed.

A partner in the twin sowing project, The Centre for Rhizobium Studies at Murdoch University, will monitor which rhizobium delivery system and which rhizobium species best suit the twin sowing concept.

Angelo indicated the twin sowing technique might be useful for topping up pastures with low legume content due to drought or prolonged cropping.

The technique's success, according to Angelo, depended on low seed cost, appropriate hard seed breakdown pattern, effective rhizobial inoculation and weed management.

He said the technique could be applied to other legume species with the capacity to produce low cost seed, such as bladder clover, gland clover and biserrula.

Further GRDC supported trials are underway to determine optimal seeding rates, seed distribution, rhizobial inoculation techniques and weed control in the regenerating year of the pasture. ■

Lupins for human consumption

The dream of marketing lupins as a food source for human consumption is about to become a commercial reality. Irwin Valley Pty Ltd, a company based at Mingenew in WA's Mid West cropping region, has successfully completed a three year technical research and development program proving up a milling process to make lupin flour.

Apart from introducing a range of lupin-based products, ranging from bread to milk, to ice cream and chocolates, future plans also involve marketing lupins for industrial uses. In addition, the by-product from the de-hulling process could be used for high protein stockfeed and possibly breakfast cereals.

Lupin milling characteristics also help to improve many food manufacturing processes and as such, lupin flour is a favoured ingredient.

A pilot mill is expected to produce 5000 to 7000 tonnes of lupin flour a year as a pre-cursor to a larger mill to be built in Mingenew, with a capacity of around 100,000 tonnes a year.

The key is the milling process

Company chairman James Yewers says that the key to what is expected to be a multi-million dollar international venture, centres on the milling process.

"We now have a process that will change the focus on lupins from a stockfeed to a premium human consumption product that we believe can outpoint soy products in all areas," he said.

"Lupins have so many health attributes that, from a marketing point of view, the sky is the limit. Wherever there is a soy product we believe lupins can become a premium alternative."

Apart from discovering the right milling process, James believes the other big advance is in taste.

"The new lupin varieties Kalya and Coromup are the favoured varieties at this stage and they produce a very sweet taste, quite unlike earlier lupin products that were around 10 years ago," he said.

The Irwin Valley company, which has 50 shareholders – the majority being farmers – would continue to take a measured



Twin sown yellow serradella trial – Brad Nutt, DAFWA research officer and co-developer of the twin sowing technique, views the GRDC supported trial with Murray Leach at his Corrigin farm. The trial was twin sown the year before.

and innovative approach to building the business.

"You can't just throw money at something like this," he said. "We've taken small steps and have adopted a steady, steady pace and we've finally come up with a commercial proposition because we've got the milling right."

"That's why big companies haven't been able to crack it (the human consumption market)."

With the Mid West region of WA recognised as one the largest lupin-growing areas in the world, James said there was plenty of confidence in securing steady supplies of lupins. Lupins for milling can also be sourced from other regions in the state.

Price premium

"We are saying to growers that we will pay a premium price for lupins that make premium lupin flour but we're also mindful that supply and demand forces will largely dictate prices," James said.

The initial market for lupin flour from the pilot mill would be bread making.

"We expect the lupin flour will form 20 per cent of bread mixes and you'll soon see lupin-based bread on the shelves of Perth and country supermarkets," he said.

"We are also looking at eastern states markets but the biggest marketing drive will be internationally."

"Marketing will be professionally driven and will occur on the basis of what is necessary and when," says James. "We're not trying to run ahead of ourselves."

"We do have a bit of a tiger by the tail here so we're being careful not to pull the tail too much at this stage."

Source: www.efarming.com.au



Lupin flour products will open up new marketing opportunities for growers.



CROP DOCTOR

With Peter Reading

MYTH BUSTING FALSE LUPIN LOGIC

Narrow-leaved lupins are a very important grain legume crop in Australia, with WA growers producing 85 per cent of the world's lupin crop.

They are a vital component of sustainable farming systems in WA's Mediterranean climate and have value as a break crop for weeds and diseases of cereals, particularly wheat.

Narrow-leaved lupins also add value to the nitrogen economy of farming systems and, with rising fertiliser costs, are expected to have an increasing value.

Yet in the past 10 years grower confidence in narrow-leaved lupins has decreased due to low and variable yields and low value on international markets.

According to Dr Jairo Palta, of CSIRO Plant Industry, WA, there are some misconceptions among researchers, consultants and growers about the growth and yield of narrow-leaved lupins, which have discouraged its adoption.

He wants to set the record straight by separating myth from reality, so growers will have confidence to give lupins a try, particularly in 'new areas' such as high rainfall areas of southern WA.

Speaking at the Grains Research and Development Corporation supported 12th International Lupin Conference in Fremantle, WA, Dr Palta said one such myth is that where soil water and nutrients are abundant, narrow-leaved lupin will grow and accumulate biomass endlessly without converting this to seed yield.

Another popular myth is that restricting growth and biomass accumulation in the apical branches (branches other than the main stem) leads to higher seed yields.

Yet investigation shows that both myths need busting.

Evaluation of a breeder's core collection under abundant soil water and nutrients in WA showed indeterminate growth ceased regardless of water and nutrient availability.

Analysis of the growth and yield on the main stem and apical branches showed total seed yield positively correlates to apical branch biomass, rather than main stem biomass alone.

Another finding was that productivity in narrow-leaved lupin is source, rather than sink limited, meaning the crop has little capacity to store and redirect reserves to the seed during grain filling.

Increasing the number of pods by applying the hormone, cytokinin, did not increase yield as many pods failed to fill their seed.

Dr Palta indicated this was due to a limited ability of the plant to accumulate carbon in vegetative parts for remobilisation in the developing grain.

Escaping terminal drought is one characteristic of modern narrow-leaved lupins, but finishing the growing season early limits the time available for biomass accumulation, generating tension between drought escape and maximising source potential.

A reduction in biomass and metabolic activity can therefore markedly decrease yield.

The Crop Doctor is GRDC Managing Director, Peter Reading, Tel 02 6166 4500. Further Information: Dr Jairo Palta, Tel 08 93333 6000.



Narrow leaved lupins growing near Wubin, WA.



Catching up at the GRDC supported 12th International Lupin Conference in Fremantle – Rod Birch of 'Catalina Farms', Coorow, Dr Peter White and Dr Mark Sweetingham, both of DAFWA and Conference Co-Convenor, Chris Saunders, of Australasian Lupin Processing, WA.