LeyGrain: a participatory action-learning model for ley pastures in cropping systems

D.L. Lloyd, B. Johnson and S.M. O'Brien
PO Box 102, Toowoomba, Queensland 4350, Australia, Email: david.lloyd@dpi.qld.gov.au

Keywords: ley pastures, action learning, profitability, Australia

Introduction Since the 1930s, crop/pasture rotation systems have been used in the wheat-sheep belt of temperate southern Australia to maintain the productivity and environmental sustainability of farming systems (Puckridge & French, 1983). Yet, in the northern grain belt of Australia, there is limited adoption of ley pastures, owing to inherently fertile and well-structured vertisol soils. However, soil fertility decline now costs the grain industry about $450 m per year. Legume-based leys are an option for improving soil OM and N and providing other benefits to cropping and livestock production systems (Lloyd *et al*., 1991). Despite strong one-on-one extension processes since the 1950s, the adoption of crop/pasture rotation systems is less than one-tenth of that in southern Australia.

A participatory learning decision support model The LeyGrain action learning process has been developed and is being implemented to focus groups of farmers on the need for ley pastures in their cropping systems and to develop their decision making skills in managing them. It is based on the participatory learning and research technique of continuous improvement and innovation. Its objective is to improve the knowledge and skills of farmers in understanding the profitability, benefits and management of these pastures and to promote an attitudinal change that results in their greater implementation. The process is based on four workshops, each of which is followed by on-farm action learning.

Workshop 1: "Benefits and profitability" Farmers believe that crop/pasture systems are less profitable than cropping systems. Thus, they fail to apply precision and timeliness in operations at the crop and pasture interfaces, predisposing to economic failure of the system. The LeyGrain farm profitability model, PRECaPS, based on MSExcel with risk analysis included, enables farmers to compare the profitability (as taxable income) of a range of crop and crop/pasture systems, using their own data or data derived in any other way. It has demonstrated the crop/pasture rotation is more profitable and a better hedge against risk than cropping alone, in all but the best 25% of years when grain prices are high. Knowledge of the bio-physical benefits of pasture phases in cropping lands is also provided for farmers in this workshop.

Workshop 2: "Getting started" - developing knowledge and skills of the benefits of leys, paddock selection, species selection, crop/pasture sequences and establishment. Well-adapted annual and perennial grasses and legumes are available to include in flexible crop/pasture sequences that are based on the commodity prices of grain crops, beef and lamb. Precision and timeliness in establishment is critical to profitability.

Workshop 3: "Making it work" – grazing and pasture management principles, providing high quality feed for targeted livestock markets, animal health. High quality pasture options can be integrated and managed to produce continuous high live weight gains to meet high value markets.

Workshop 4: "Back to crop" – removing the pasture, timing the removal to replenish soil mineral nitrogen and water, reconsidering the crop and pasture sequences. Managing the interface between pasture and crop to minimise the time out of production and replenishing soil water and mineral nitrogen is vital to profitability.

LeyGrain has been road tested with six groups of farmers ranging in number from 5 to 25, with whom the action learning process is on going and continuous. The process utilises the expertise of many disciplines. It ensures that the formal workshops are followed by action on farm - pasture sowings and so on. Thus, it is embedding on-farm comparisons and research within an extension framework. Thereby, the focus on pastures is maintained. Farmers have been surprised by economic analyses that have consistently demonstrated the profitability of ley pasture systems and the economic hedge value of pastures in the system. The process is in its early stages, but farmers are now committing to increased pasture establishment.

References

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