

## **How pulse manuring fits our farm system**

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### **Take home messages:**

- Field peas have provided an alternative for crop rotation and weed control in our 100% cropping enterprise.
- There are both pros and cons to a brown manuring system; it is not a silver bullet.
- We believe we will see financial benefits as we refine the system.

### **Background/History**

Woodlea Ag Enterprises is a family partnership at Lockhart in the southern Riverina of NSW. The operation side of our business consists of Steven and me, along with the experience and guidance of our father Max. Our wives and family also form an important part of the team and assist in the decision making process. We are also well supported by a farm advisor, business lawyer and accountant, all experts in their fields. After Steven and I completed our tertiary education at the University of Sydney and University of Melbourne respectively, we both moved to the farm business, Steven in 2000 and I in 2004.

The arable area under management consists of 4400ha, on which wheat, canola, barley and field peas are grown. 100% of this arable area is sown annually. There are no livestock in the production system. We have developed a farming system that suits the resources we have available, including labour. Our farming system has been heavily influenced by personal choice and a desire to increase the area under management.

All farm operations are carried out with our own equipment, with an additional contract header at harvest. This suits our farming system and allows us to ensure that in-paddock operations are conducted in a timely manner. It also means that we are monitoring the paddocks on a regular basis. We have designed a cropping system that has allowed us to substitute capital for labour, which we feel is not as achievable in a livestock system.

Paddock operations are all based around a 3m controlled traffic farming system on RTK guidance. All implements are matched to the 3m system to reduce soil compaction. In the past, our crops have all been sown with a tyne implement which has been evolved over the years to be a coulter- knife point and press wheel configuration. In the coming season we will move to a disc machine. Our sowing operation utilises variable rate technology (VRT) for phosphorus application, and we have now introduced VRT application of lime with the assistance of pH mapping.

### **Machinery resources**

- Goldacres 36M sprayer
- 12m NDF single disc seeder, 250mm spacing (new 2013 Season)
- 12m Alfarm bar, 308mm spacing, coulter-knife point-press-wheel configuration.
- John Deere 8335RT Track, and 8225R wheel tractor
- John Deere 9770 header
- 12m Macdon front to windrow and harvest
- M205 Macdon Self Propelled Windrower

### **Why brown manure field peas**

Our traditional crop rotation consisted of canola-wheat-wheat, and in 2009 we observed that many paddocks were building a weed seed bank that was unmanageable in a 100% cropped and harvested system. To us, this posed a risk in our continuous cropping program, and led to the introduction of a brown manure phase as recommended by our local agronomist.

The benefits of crop rotation is widely known and understood in the grains industry. Although we had adopted canola as a break crop into our rotation many years ago, the use of a manure crop was new to our system, but not new to the industry. The manure crop has traditionally been utilised in a mixed farming system, and we have fine tuned this concept to suit our 100% cropping system. While we understand the current system is not perfect and can be refined, it is felt to be a step towards a more robust cropping system.

Field peas are currently the crop of choice due to their ability to provide excellent groundcover and high production of biomass, which in turn provides good weed competition. We have sown lupins and faba beans in the past, but found that they didn't provide the biomass and groundcover we were after. A number of benefits have been realised in subsequent years of the brown manure field pea crop including: improved grain quality, improved yield, reduced disease levels and a boost in natural levels of nitrogen. There is also a moisture benefit, in some years, to subsequent crops due to the unused water in the soil profile.

This system has reduced the application of expensive nitrogen and our use of in-crop herbicides for broadleaf and grass control have been scaled back. We are not entering the paddock once the field peas are sown resulting in a substantial increase in time efficiencies.

Although we are still in the early days of the system, early analysis shows that this program can compete with both mixed farming and continuous cropping systems. As more data becomes available over different seasonal conditions and soil types we will have a greater confidence of the system into the future.

### **Management**

- Sow early to capitalize on warm soil temperatures and allow for phosphorus and other nutrients to be explored.

- Select a variety that has quick early growth habit to obtain ground cover early and to produce high biomass. This will in turn provide high weed competition.
- Timing of the initial knockdown is important.
- Chemical selection planning through the whole rotation.
- When brown manuring use double-knock technique.
- Grazing is not a preferred practice due to the impacts on ground cover.

#### **Pros**

- Natural nitrogen release
- Easier management through less in-season operations.
- Reduced weed seed bank.
- Structured approach to crop rotation planning.
- Wider sowing window to increase machine utilisation.
- Lower capital required through a lower variable costs.
- Nitrogen management is simpler.
- Peas provide excellent competition for weeds during the fallow phase.
- Minimal starter fertiliser and in-crop spending.
- Pea residue provides good ground cover for improved water infiltration.

#### **Cons**

- Risk of disease in pulses has the potential to wipe out crops especially if widely adopted.
- Potentially lower soil moisture for subsequent crops compared to chemical/traditional fallow.
- Up front seed and sowing costs.
- Slow release of nitrogen in the first year after peas, some starter N may be required.
- Higher summer weed pressure due to retained moisture and nutrition.

The adoption of brown manure field peas in a farming system is not a silver bullet. In our farming system we have seen a number of benefits and it will form a major part of our cropping system in coming years. As we refine the system we strongly believe that the benefits will be realised in financial terms.

#### **Contact details**

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