



## IRRIGATION RESEARCH & EXTENSION COMMITTEE

2007



FOR IRRIGATION CROPPERS

**Double cropping – is fodder in  
the rotation the key to success?**

**Paper prepared by**

**DAMIAN JONES**

DPI Vic

Ph: 03 5450 9525

Email: [Damian.Jones@dpi.vic.gov.au](mailto:Damian.Jones@dpi.vic.gov.au)

**IREC**

C/- CSIRO Land and Water, Griffith

Private mail bag 3 Griffith NSW 2680

**Tel:** 02 69601550 **Fax:** 02 69601562 **Email:** [irec@irec.org.au](mailto:irec@irec.org.au)

## Project Background

Double cropping systems (growing a winter and summer crop following one another) provide the opportunity for farmers to capitalise on their investment in irrigated agriculture. However it is not simply sowing a winter crop then follow it with a summer crop. Trying to match a range of agronomic features such as maturity, herbicide tolerance and stubble management make double cropping a task that requires a lot of planning. Best management practices have been identified for most irrigated crops, but rotation systems involving double cropping have been neglected, particularly in Victoria. Therefore the correct crop selection, layout and irrigation management essential to making the system work need to be identified.

The project is examining a number of aspects of double cropping including suitable rotations or sequences, profitability and sustainability. Making use of water “left over” from the previous crop has the potential to increase the Water Use Efficiency and reduce the potential for water to travel past the rootzone and add to the watertable. This water also has nutrients that may be pollutants. The double cropping system allows the potential for retrieval of these nutrients and makes productive use of them.

As well as the focus on double-cropping, the project will demonstrate the best management practice for the individual crops, highlighting such issues as nutrient budgeting to reduce money wasted on excess inputs or nutrient loss to the environment.

The project has established trial and demonstration sites in Northern Victoria near Echuca, that are testing the assumed best bets for suitable double crop sequences and compare them to current systems to evaluate the potential increase in productivity and water use efficiencies of the two systems.

The treatments are combinations of currently grown winter crops (canola, wheat, barley, faba beans and oaten hay) and summer crops (maize grain, maize silage, soybeans and forage sorghum).

The project is an Irrigated Cropping Forum project, funded by GRDC and DPI Victoria, and overseen by the Victorian Irrigated Cropping Council.

## Double Cropping So Far

Many studies have been conducted looking at the feasibility and economic potential of double cropping, particularly in NSW, many of these studies have centred around rice and date back into the eighties. But from a Victorian perspective, rice is a minor crop, layouts may be more suited to alternative crops (principally bordercheck layouts) and farms tend to be smaller with a greater allocation per hectare. Other areas that these studies may not have addressed include winter fodder crops as part of the system and the constant improvement in varieties available particularly with shorter maturity. For a summary of what has been done, refer to Andrew Schipp’s article on Intensive Rotations Revisited in the IREC Farmers’ Newsletter, No. 173 spring 2006.

During the project development, one comment was made regarding double cropping as trying to fit 13 months into one year. This was found during the previous work on double cropping when trying to fit maize and wheat into the sequence – hold-ups in operations or the crop’s growing season length being too long, prevented the next crop going in on time and impacted on the subsequent yields. While there is a greater choice of earlier maturity varieties in most crop types, an alternative option to the winter grain crops is fodder crops, which give the flexibility to get the next crop in the sequence right.

## Why Fodder Crops?

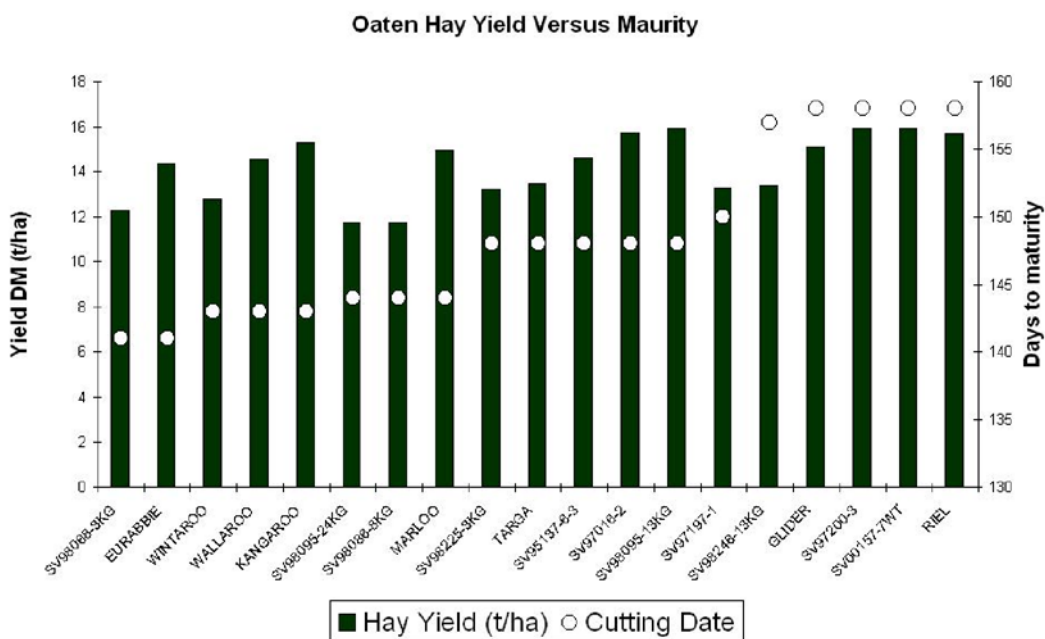
Fodder crops, and in particular winter fodder crops, have a number of reasons why they make ideal options for fitting in a double crop sequence:

1. As part of the fodder conservation process, the plant material is removed from the paddock resulting in less trash for the machinery sowing/preparing for the next sequence to have to deal with.
2. While removing the actual crop, there is the opportunity to take away weeds as well. This is an important

factor where herbicides have been relied upon to control weeds in the sequences and the growing prevalence of herbicide resistance to Groups A & B herbicides. Another advantage of carting the weeds away rather than spraying them out is the reduced reliance on herbicides, which can be an issue when trying to find herbicide solutions that have no impact, ie herbicide residues, on the following crop.

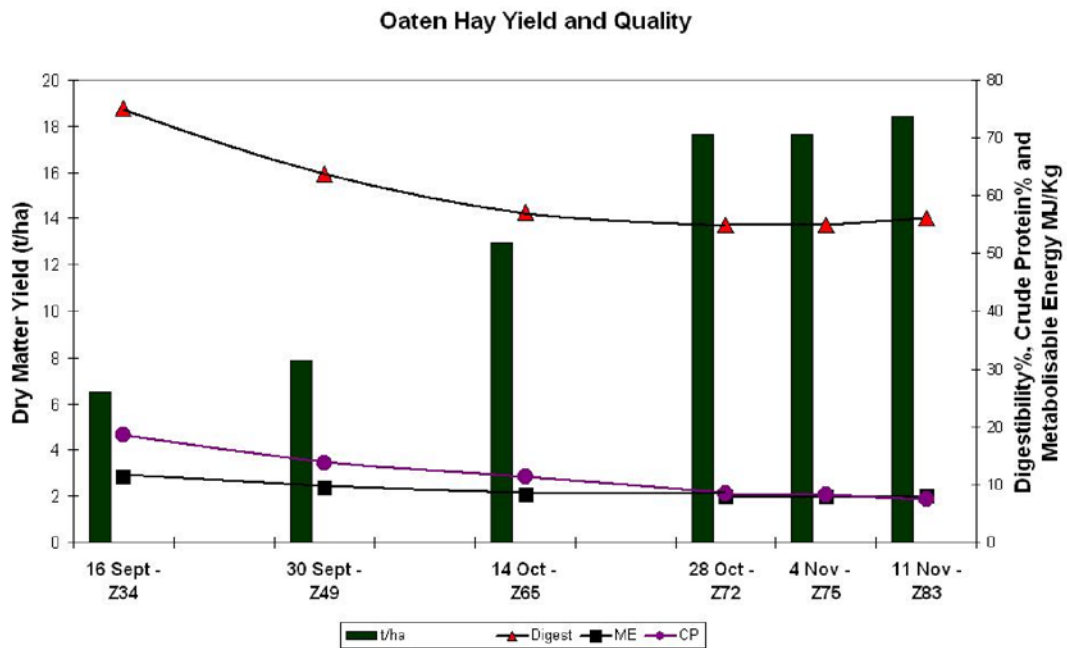
3. Pasture or oaten hay have far more flexibility in sowing and harvest time, especially compared to grain crops. Oat varieties have a huge range of maturities, giving the flexibility of matching sowing time with preferred cutting dates to either match the season or the ability to get the crop cut and off and out of the way for the next crop in the sequence.
4. Given the variability of allocations in recent times, winter fodder crops have the advantage of not needing to be sown in early May, which may require irrigation water. If allocations are tight in spring, the crop can be cut when it runs out of water with (hopefully) minimal impact on yields.
5. Markets are available and expanding for hay, ranging from the traditional stockfeed market, the increasing feedlot development in the area, export of oaten hay and supplying the dairy industry with roughage (approximately 500,000 t of hay is used by the dairy industry in Victoria each year).

On the Victorian Irrigated Cropping Council trial block at Kerang, irrigated oaten hay variety evaluation and management has been a focus for many years. The first graph shows that longer maturity does not necessarily mean more hay produced. This 2005 variety trial was sown on June 6<sup>th</sup>, and cut at milky stage.



Graph 1: 2005 Variety Trial – Dry Matter Yields and Days to Cutting

Along with nitrogen management to maximise yields, a trial in 2005 looked at the dry matter yields and quality over time of a crop of Marloo oats sown on June 9th. Cutting started at Z34 (fourth node stage) and was repeated at Z49 (first heads visible), Z65 (full flowering), Z72 (watery ripe), Z75 (milky) and Z83 (early dough).



Graph 2: Quality and Dry Matter Production of Marloo Oats over time.

As can be seen from the graph, yield did not increase beyond the watery ripe stage (where the developing grain has reached full length but the contents are still clear). Given the relatively late sowing, this cutting date could be earlier if sowing was earlier, making maize in the double cropping sequence a proposition based on timely sowing.

With the hay shortages of the last few years, the gross margin for oaten hay has been quite profitable. Based on 12t/ha at \$150/t and owning your own equipment, the gross margin is around \$1000/ha.

### Conclusion

Fodder crops, in particular winter hay production, have many advantages for inclusion in a double cropping sequence. They offer the chance to get the following crop in on time both from a crop maturity and paddock preparation, can help in weed management and can be profitable in their own right.