



IRRIGATION RESEARCH & EXTENSION COMMITTEE

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FOR IRRIGATION CROPPERS

***Faba check in southern NSW
– what have we learned?***

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Take home message

Over the past five years there has been renewed interest in irrigated faba beans as varieties with improved disease resistance have been developed and management packages for disease have been implemented. In the Riverina a realistic and achievable yield for irrigated faba beans is 4–5 t/ha, making them a worthwhile component of irrigated crop rotations. Although often considered more risky and less profitable to grow than wheat, their high yield potential as well as the benefits they provide for the following wheat crop make them an attractive and viable option.

From 2000 to 2004 *Faba Check* has provided a way of benchmarking district crops. It has also paved the way for fabas to lose the tag of ‘failure beans’ they were given in the mid 90’s where disease, mainly chocolate spot, devastated crops. Now the tag has moved to ‘failure in management’.

Faba beans and *Faba Check* 2000 to 2004

Although the area of faba beans in the district has fluctuated due to water availability, faba bean prices, rotational constraints and other commodity prices there has been a general increase in faba beans planted throughout southern irrigation districts since 1999. This is shown in Figure 1.

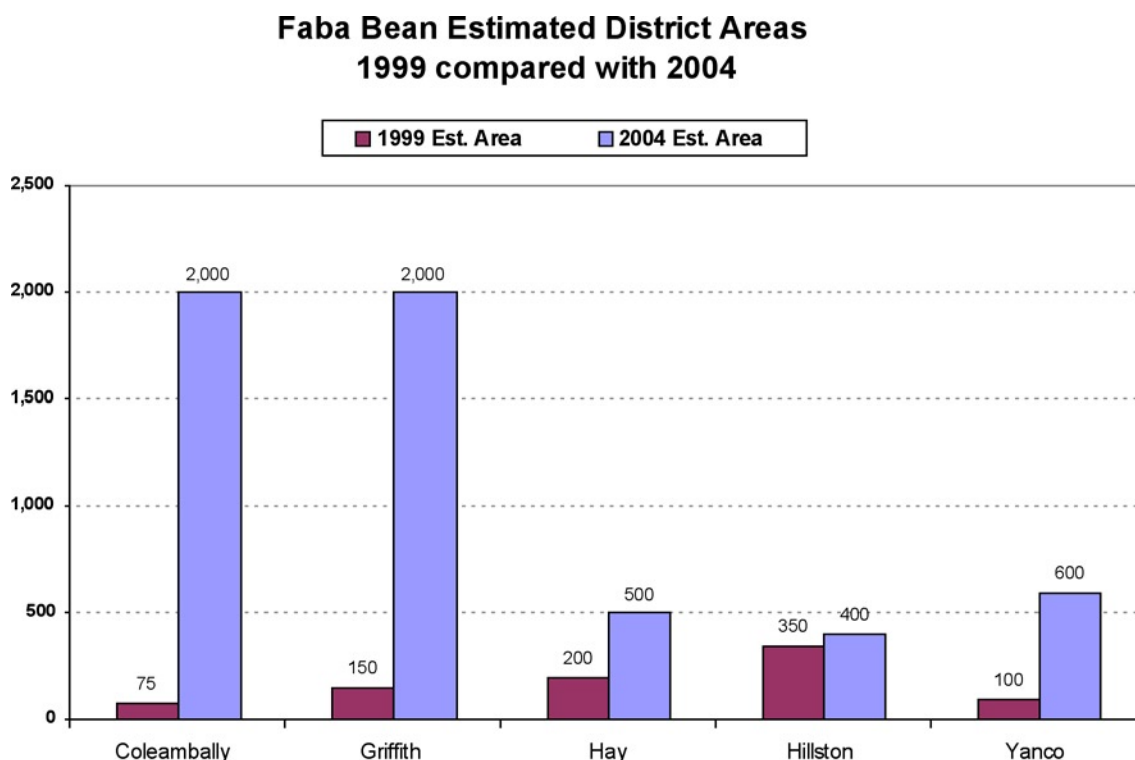


Figure 1. NSW DPI District Agronomist faba bean area estimates 1999 compared to 2004.
Source: NSW DPI Grains Reports December 1999 and 2004

The main reasons for this increase in area, as mentioned above, relate to better varieties, management strategies available for disease as well as a better understanding of overall best management practices.

Since the resurgence of faba beans in 2000 *Faba Check* has also enabled us to identify the key management practices in achieving high yielding, good quality irrigated faba beans. Although seasonal conditions play a large part in determining the overall yield and quality of faba beans, growers who have followed best management practices over the past five years have consistently achieved high yields and good quality. The keys to their success have been a good irrigation layout, a commitment to frequent watering in the spring and having a strategic fungicide strategy (even in dry years).

As well as the factors mentioned above *Faba Check* and best management practices have also played a part in the improvement of average districts yields. This is shown in Figure 2 when comparing average district yields of 1999 to the average yields of 2004

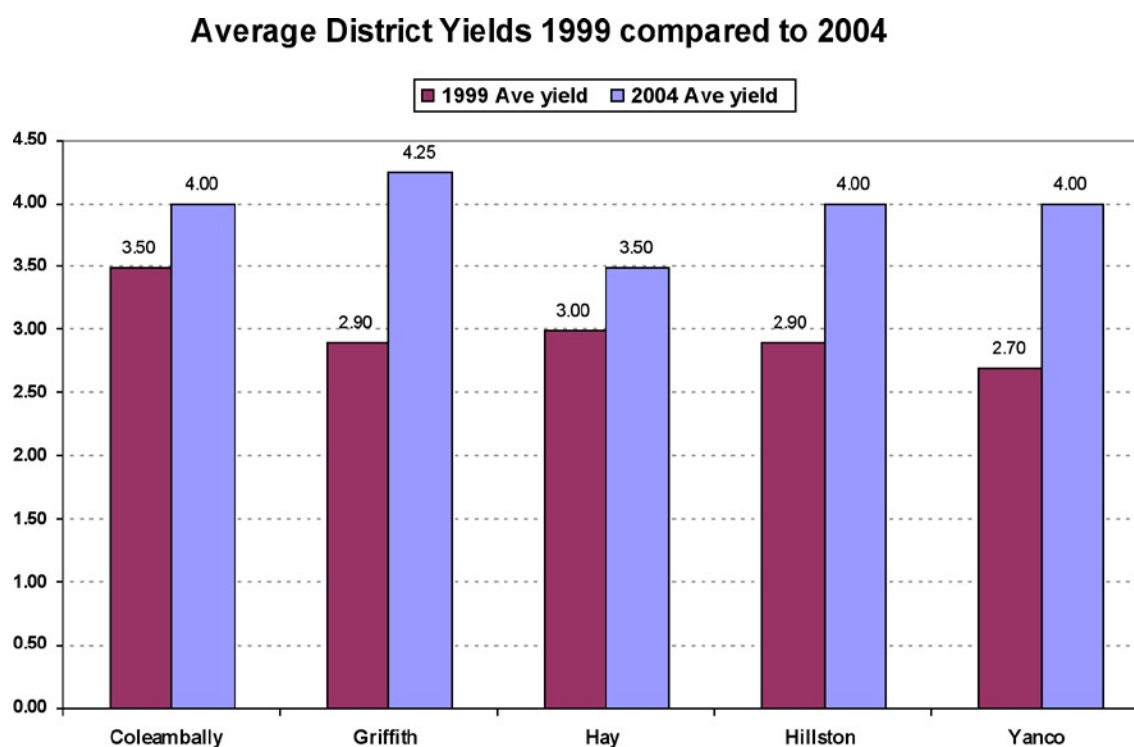


Figure 2. NSW DPI District Agronomist faba bean yield estimates; 1999 compared to 2004.
Source: NSW DPI Grains Reports December 1999 and 2004

2000 Faba Check Highlights

2000 was the first year district crops were benchmarked and for many growers it was the first time they had ever grown faba beans. Yields ranged from 1.5 t/ha up to 5.5 t/ha, with average yields around 3.75 t/ha. Growers really tested the boundaries of fabas, with a lot growing them on the flat (on all sorts of slopes), with rain after the first spring irrigation causing considerable damage. Therefore the two biggest factors in 2000 impacting on yields locally were water logging in the spring and lodging at harvest.

The main lessons learnt from 2000 were:

- Check soil pH as faba beans don't like acid soils with pH below 5.2 (CaCl₂)
- Don't grow on freshly land formed paddocks, particularly if there are big cut and fill areas
- Only grow on your best soil types
- Calibrate seeders after inoculating to get the correct plant population
- Irrigation layout is one of the most important things for the final spring irrigation, as a result faba beans performed best on bed layouts with waterlogging a big issue on contour layouts
- Be aware of potential damage from herbicide residue problems, particularly from boom spray contamination
- Lodging proved to be an issue at harvest and was a bigger problem on beds as plants were harder to pick up from furrows. Growers learnt the importance of harvesting one way
- Thrips were a problem at flowering in 2000 and growers who treated for them were unsure whether control was really worth it.

2001 Faba Check Highlights

Seasonal conditions in 2001 contrasted those of 2000. With below average rain throughout most of the winter months crops showed signs of moisture stress towards the end of July and early August. Some crops actually lost yield potential at this critical time as they awaited for the start of the irrigation season. The dry conditions and improved disease management strategies meant the incidence of disease was generally low. District yields ranged from 1.5 t/ha up to 6.2 t/ha, with average yields around 3.75–4.0 t/ha. These crops were grown with 5–6 fungicide sprays.

The main lessons learnt from 2001 were:

- Check seeders capabilities as seed size was an issue for some, often causing seeder blockages and/or resulting in sowing insufficient seeds per square metre. As seed size is a heritable trait it is not advisable to grade out the large seed, as the resultant crop may not meet market specifications
- Sowing with a spreader (broadcasting) and then harrowing in 2001 gave variable results leading to poor establishment as there was no soil to seed contact, with seed often getting buried too deep or sitting on the surface
- Growers became aware of the benefits that faba beans provide to following wheat crops.

2002 Faba Check Highlights

The uncertainty of faba bean prices at the beginning of the 2002 season, rotational constraints and good wheat prices saw a decline in faba bean plantings across the Riverina in 2002. As a result no *Faba Check* report was compiled in 2002.

Irrigated growers though who stuck to their rotation despite the outlook and planted faba beans and followed best practice management were rewarded with high yielding good quality faba bean crops. Yields of just under 6 t/ha were achieved around Griffith through good weed control in previous crops, good irrigation layouts, timely spring irrigations and the strategic use of fungicides.

2003 Faba Check Highlights

2003 saw the introduction of the Agrinational Marketing Pool for faba beans (now offered under the name of parent company Ecom Commodities). Crops which were committed to the Pool had the advantage of being an acreage commitment only, taking out the production risk of fixed tonnage contracts. Growers were also given the benefits of dedicated receival facilities and attractive payment terms. This saw an increase in the area of faba beans grown locally in 2003.

2003 district yields ranged from 2.0 t/ha to just over 6.0 t/ha, with average yields around 3.75–4.0 t/ha. The district's top yielding crop, grown on raised beds on self-mulching black soil near Widgelli, east of Griffith, yielded 6.2 t/ha. These crops were grown with 4–5 fungicide sprays. The season was exceptionally mild and hosted a number of frosts late in the season. Crop yields and grain quality were generally quite good, with the common comment being that grain size was smaller than usual, although still within delivery standards, due to the mild conditions.

The main lessons learnt from 2003 were:

- Not to sow too early as crops sown before May suffered from lodging. Sowing early to mid May helps to avoid the problem and maximises yield potential.

Growers who made every effort to achieve optimum plant populations, paid close attention to plant nutrition, kept up to date with disease prevention, were able to minimise moisture stress due to optimum irrigation layouts and managed to miss out on the hail storms in 2003 performed the best.

2004 Faba Check Highlights

Faba Check data for 2004 is still coming in so is yet to be fully analysed. District yields have shown mixed results with yields around 8–10% down on previous years, possibly due to the hot conditions experienced in September/October. Due to the dry season crops on beds generally received 2–3 spring irrigations, after being watered up.

One of the biggest issues in 2004 was heliothis with the majority of crops needing to be sprayed. Given 2004 was a dry year 4–5 fungicide sprays were still used.

Faba Check Trends

Whilst wheat remains the main winter crop grown in the area, faba beans have become an integral part of the irrigated cropping rotation locally since 2000. As water allocations have tightened growers have been looking ahead and questioning how much ground to leave for summer crops, in particular rice. If the area of rice is decreased, concerns have been raised about the rotational constraints that may be encountered with growing consecutive wheat crops, so alternatives such as faba beans have been adopted.

Since 2000 there has been a move towards more suitable layouts for faba beans, with a higher proportion of crops now grown on beds compared to the flat. *Faba Check* results support this. In 2000 34% of *Faba Check* crops were on beds, 38% on bordercheck and 28% on contour and in 2003 82% were on beds and 18% on bordercheck (although not represented in *Faba Check* there were still a small percentage on contour in 2003).

These more suitable layouts have given growers flexibility in the spring and take out the waterlogging risk, particularly after the last spring irrigation. Table 1 below shows the break up of irrigation layout and yields in *Faba Check* from 2000 to 2003.

Table1. Irrigation Layout v's Yield 2000 to 2003 – Faba Check

YEAR	IRRIGATION LAYOUT YIELDS (t/ha)			
	BEDS	BORDERCHECK	CONTOUR	OTHER
2000	4.57	3.87	3.29	–
2001	4.37	4.04	3.72	3.7
2002	N/A	N/A	N/A	N/A
2003	5.16	3.77	–	–
AVERAGE	4.7	3.89	3.51	

N/A refers to no Faba Check Data for 2002. Other refers to sprinkler irrigation

Source Faba Check Reports 2000, 2001 and 2003.

Faba beans grown on beds have consistently out performed faba beans grown on any other layout. Given this, *Faba Check* results also show that the Water Use Efficiency (WUE) of faba beans grown on beds is higher than faba beans grown on bordercheck. The data since 2000 shows an average WUE of 12.50 kg grain/mm water for faba beans grown on beds compared to an average WUE of 9.88 kg grain/mm water for faba beans grown on bordercheck.

Growers since 2000 have also adopted a well planned disease management strategy and are prepared to spray, 4, 5 or even 6 times for disease, depending on seasonal conditions. This has meant that the build up of disease during winter is being effectively prevented and protection against disease in the spring is provided before each watering whilst the canopy humidity and disease risk are high.

Strategic fungicide applications adopted by district growers are outlined below:

- An application of Mancozeb (mostly 1.5–2.0 kg/ha) 4 to 6 weeks after the crop has emerged – targeting mainly ascochyta
- Applications (number will depend on the level of disease in the crop and seasonal conditions) of Mancozeb (mostly 1.5–2.0 kg/ha) and/or Carbendazim (500ml/ha) throughout the most active growth period for chocolate spot. Growers often substitute at least one Mancozeb spray with Carbendazim, it is usually the last spray before the final Mancozeb application
- Final application of Mancozeb (mostly 1.5–2.0 kg/ha) – targeting rust and ascochyta.

Over the past four years it has generally been the same growers who are consistently achieving high yields of 5–6 t/ha for faba beans. The key to their success has been their regular adoption of the key best management practices, tying in paddock selection, layout selection, good weed, insect and disease control and spring irrigation requirements.

Conclusion

Faba Check has shown growers and their advisers the way forward in terms of crop management and identified the main factors for success of local irrigated crops. It has put faba beans in context with other crops as they require a higher level of management input than other winter crops. By benchmarking crops against others in the district growers are able to see where improvements in their management systems can be made in order to achieve higher yields and better quality.

Faba Check has seen faba beans now being grown on more suitable layouts. It has helped growers to realise the importance of adopting a well planned disease management strategy and has also helped growers to look beyond the reputation that faba beans received in the mid 1990's.

Acknowledgements

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References

- Whitworth, R; Carpenter, D.J. (2002). *Irrigated Faba Bean Management. Irrigation Achieving Your Potential*. GRDC Grower's Update.
- Whitworth, R; McCaffery, D. (2001). *Faba Bean Management 2001*. Farmers Newsletter. IREC No. 157.
- Whitworth, R; (2000). *2000 Irrigated Faba Bean Survey – Griffith District Grower Report Crop Check NSW Agriculture*.
- Whitworth, R; (2001). *2001 Irrigated Faba Bean Survey – Griffith District Grower Report Crop Check NSW Agriculture*.
- Whitworth, R; (2003). *2003 Irrigated Faba Bean Survey – Griffith District Grower Report Crop Check NSW Agriculture*.
- Matthews, P; Carpenter, D.J. (2002). *Foliar disease of faba beans Management in southern NSW*. Pulse Point 16.