

Healthy Country

managing the land for healthy waterways



Horticulture and cropping benchmark update

Lockyer and Bremer catchments

2008–09



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FarmFLOW
growth through good practice

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Background

The following report contains the results from the 2008/09 benchmarking of horticultural and cropping producers in the Lockyer and Bremer catchments of South East Queensland. Also included in this report are updates on those producers initially benchmarked in 2008.

The benchmarking process has been valuable as a tool for understanding the cropping systems in the Healthy Country program priority catchments of the Lockyer and Bremer. It provides a snapshot of current management practices in horticulture and cropping systems in these regions, particularly those that relate to soil and nutrient management. Changes in on farm practices have also been identified in updates with those growers previously benchmarked.

Accessing growers has been facilitated greatly by the use of existing QPIF grower contacts within the Lockyer valley. However, there has been a marked contrast in existing grower contacts between the Lockyer and Bremer catchments. Grower contacts in the Bremer catchment have been more limited and access has been more difficult due to limited existing interaction with QPIF staff or other project partners. Progress has also been slower due to a lack grower understanding of the role of extension staff as this area has not previously had exposure and access to extension services.

Benchmarking update

General information

Farm sizes of those growers surveyed ranged from 70 ha to 360 ha. The area benchmarked in 2008-2009 was 1330 ha. In total, the area benchmarked through the Healthy Country project is 2660 ha. Approximately 15-20% of growers in the Bremer and Lockyer regions have been benchmarked to date.

The general attitude by larger growers was that production size needs to increase to remain viable. Smaller family operations that are not able to increase their production areas will not be able to remain a viable farming operation.

Farm enterprises surveyed to date have all been family operations. The majority of operations surveyed in 2008/09 are run by the younger generation (less than 45 years of age) who have taken over the day to day running of the business but parents are still involved. This contrasts with the initial 2008 benchmarking which predominantly involved younger generation farmers (less than 45 years of age) running the business without parental involvement. Overall in the total benchmarking to date the figures for each of these groups are the same.

Table 1. Interviewed landholder demographics

	2008-09 update	2008	Total benchmarking
Younger generation growers (<45 years)	18%	55%	40%
Younger generation taking over from father. Father still involved	73%	9%	40%
Older generation growers (>45 years)	9%	18%	20%

The range of crops grown by benchmarked producers includes:

- potatoes
- carrots
- celery
- pumpkins
- tomatoes
- watermelons
- broccoli
- cauliflower
- cabbage
- sweet corn
- green beans
- sorghum
- lucerne
- wheat hay
- soybeans
- lablab
- chinese cabbage
- broccolini
- grape tomatoes
- cherry tomatoes
- maize
- shallots
- stonefruit
- raddish
- english spinach
- silverbeet

The growers surveyed grow between four and nine different crops in a rotation and can have up to 5-6 different crops in the ground at one time.

Approximately 10% of growers surveyed in 2008/09 have grazing country in addition to their cultivation, 20% of growers in the total benchmarking to date.

Ten percent (10 %) of growers surveyed to date have been certified organic growers.

Rotations

Fifty per cent (50%) of those producers surveyed alter their cropping frequency with the availability of water. This figure has been consistent across all benchmarking to date.

Cropping intensity has tended to vary from 1-2.5 crops per year.

- 1 crop/year; 27% benchmarked growers
- 1-1.5 crops per year with limited water and increase to 2-2.5 crops per year with increased water availability; 45% benchmarked growers
- 2 crops per year; 27% benchmarked growers

The figure for changing crop intensity in relation to water availability may reflect increased water availability over the last twelve months and also different locations within the catchment. Cropping intensity will also be dependent on crop choice and the associated growing season length. Cropping rotation decisions are primarily based on marketing opportunities and prices.

Table 2. Rotation management practices identified in horticultural benchmarking

Management practice	2008/09	2008	Total benchmarking
Alter cropping frequency	50%	50%	50%
1.5 and less crops/year	27%	50%	35%
> 1.5 crops/year	73%	50%	65%
Legume rotation	63%	77%	70%

Sixty-three per cent (63%) of benchmarked growers include a legume in their rotation such as lablab, soybeans, lucerne or green beans. This compares to 77% of growers in the initial benchmarking with 70% including a legume rotation in the overall benchmarking undertaken to date. The initial benchmarking identified a wider range of legume options. Legume rotations may be cash crops such as green beans or lucerne or green manure options such as lablab.

Only 9% of growers surveyed in 2008/09 grow lucerne. Of the total growers surveyed to date 20% include lucerne in the rotation. Lucerne rotations generally last between 2-5 years with approximately 7-8 cuts per year. Lucerne is a great management option due to the long term cover it provides with minimal tillage. It also fixes nitrogen in the soil as well as providing organic matter each time it is cut. However, the lucerne rotation may result in compaction issues due to the machinery operations associated with cutting and baling and the lack of defined traffic pathways in the field.

Cover crops

Seventy-three per cent (73%) of those growers benchmarked regularly include cover crops in their rotation. By their definition, cover crops refer to those that they grow to provide cover in the field. They will more often than not obtain some income from these crops and they differ in this respect from green manure crops. Cover crops are incorporated into the rotation for various reasons including soil protection from erosion, addition of soil organic matter through crop trash/stubble, nutrition value and soil structure. Cover crops are primarily grain or fodder crops such as sorghum, wheat, maize, soybeans. They are predominantly summer crops as this coincides with the seasonal probability for intense rainfall events and the need for soil protection and these growers are aware of this. Trash and stubble from cover crops are incorporated back into the soil. Cover crops and green manure crops are not generally irrigated with available water conserved for high value horticultural crops.

One grower does try to keep as much of his crop residue on the surface of his soil as a cover and mulch to assist in retaining soil moisture and weed control.

Eighteen (18%) per cent of those surveyed include a green manure crop in their rotation where the crop is incorporated rather than harvested. This compares with only 11% identified in the initial benchmarking and 15% of growers surveyed in total.

Table 3. Cover cropping practices identified in horticultural benchmarking

Management practice	2008/09	2008	Total benchmarking
Incorporates cover crops	73%	66%	75%
Incorporates green manure crop	9%	11%	15%

Soil health

Nutrition management

All growers benchmarked (100%) in 2008/09 undertake some soil testing. This compares with 88% of growers in the initial benchmarking. Of the total number of crop producers surveyed to date 95% undertake soil testing. The frequency of soil testing varies from every year to infrequently or when growers suspect they may have a nutrition issue. The use of soil testing results also varies and

growers do not necessarily use soil test results to determine their fertiliser programs.

Forty-five per cent (45%) make fertiliser decisions based on soil test results. In the 2008 benchmarking this figure was 33%. Of the total benchmarking to date 55% consider soil tests when making fertiliser decisions. This consideration generally involves using soil test results as a check to determine if there is any need to make changes to their standard fertiliser program. Other factors that influence fertiliser programs include soil type and rainfall events. Growers may add some additional nitrogen if prolonged wet periods are experienced to replace any losses through leaching.

Table 4. Nutrition management practices identified in horticultural benchmarking.

Management practice	2008/09	2008	Total benchmarking
Soil testing	100%	88%	95%
Consideration of soil test results in fertiliser decisions	45%	33%	55%
Use of composts	36%	33%	35%
Monitoring soil carbon	9%	22%	15%

Of those producers that include a legume in their rotation, 28% consider the nitrogen benefits of these legumes when making fertiliser decisions. Eighteen (18%) per cent of growers surveyed include a green manure crop for nutrition benefits. These growers tend to be those who have organic production.

All fertiliser programs include some base fertiliser up front before planting with split applications in crop either by side dressing or fertigation.

Other soil nutrition additives include various compost products and chicken manure. Blood and bone is also used by organic producers.

Thirty-six per cent (36%) apply composts to their crops for soil organic matter benefits but also for other nutritional benefits as organic matter increases the availability of some nutrients. This is consistent with 33% in the initial benchmarking using composts.

Nine percent of growers surveyed monitor soil carbon levels. This is lower than the 22% in the initial 2008 benchmarking. Of those surveyed overall, 15% monitor soil carbon levels. However, there does seem to be some confusion amongst growers regarding the relationship between soil carbon and organic matter.

Erosion and sediment control

Soil management issues identified so far by benchmarked growers include increasing and/or maintaining organic matter, compaction and general soil health which encompasses structural and nutritional aspects. These issues are similar to those identified in the initial 2008 benchmarking.

Of the growers surveyed over 60% had concerns with potential soil loss in intensive rainfall events. These growers also tended to have

country with greater slopes. Of those that were not concerned about erosion and potential loss their properties drain away from the adjacent waterway with networks of grassed drains capturing flow from fields and providing filtering of sediment.

Those growers with erosion concerns have put in place various management and sediment control options. Twenty-eight (28) per cent have or are in the process of putting in place contour banks on country of greater slope. These have primarily been undertaken in the focal area through on ground works as part of the Healthy Country program. Twenty-eight (28) percent of growers are also interested in options for mulching vegetable crops.

The use of GPS guidance and controlled traffic farming are also soil management options that have been identified by some growers. Of those surveyed in 2008/09 thirty-six (36) per cent have GPS guidance, 9% are in the process of purchasing guidance and another 9% will purchase in the next 12 months. This compares to 22% of those benchmarked in 2008 with GPS with another 11% interested in GPS guidance. In total, 30% of growers surveyed to date have implemented GPS guidance. The majority of these have implemented this technology in the last 12 months. Of this, 10% percent were growers initially benchmarked 12 months ago that have since implemented GPS guidance and are exploring their options for controlled traffic farming.

Forty-five (45) per cent of benchmarked growers are interested in the potential benefits of GPS guidance and controlled traffic farming to their production system. For 18% of surveyed growers, while they are interested and keen to implement GPS guidance technology into their production system, currently the cost is prohibitive.

Of the total growers benchmarked with GPS guidance, 50% have been able to reduce their number of tillage operations using this technology. This represents 18% of growers surveyed in 2008/09. All of those with GPS have been able to get greater machinery efficiencies through excluding some machinery operations and subsequent labour and fuel savings. Twenty-seven per cent of those surveyed in 2008/09 are interested in moving towards a CTF system. However, only 50% of these growers already have GPS guidance. Some growers with guidance systems are not considering their options to reduce tillage or move towards a controlled traffic system and have essentially invested in this technology to 'drive straight'.

Over 90% of surveyed growers have on farm dams for water storage that would also act to capture sediment. Of those surveyed, 18% have developed on farm sediment traps and associated grassed drainage systems specifically for this purpose.

Irrigation

Irrigation systems are primarily overhead solid set/hand shift systems with all growers surveyed using this system as their predominant irrigation system. This compares with 77% of surveyed growers in the 2008 benchmarking. In the overall benchmarking, 90% of growers use solid set/hand shift irrigation systems.

Table 5. Irrigation management practices identified in horticultural benchmarking.

Management practice	2008/09	2008	Total benchmarking
Hand shift/solid set irrigation	100%	77%	90%
Trickle/drip irrigation	55%	33%	45%
Schedule irrigations	9%	44%	25%

Fifty-five (55%) per cent of growers also had some trickle/drip irrigation. For these growers the cost of trickle/drip is cost prohibitive to implement across their whole production system. The ability to re use the tape in more than one crop would help alleviate this barrier. There are also waste disposal issues associated with used tape. All growers with trickle/drip found it more water efficient than other irrigation systems. However, all growers with trickle/drip still require overhead hand shift systems to establish seedling crops before using trickle/drip in crop. Other irrigation systems still in use by those surveyed include gun winches and boom irrigators.

Only 9% of those surveyed used irrigation scheduling tools. The remainder schedule irrigations based on a variety of factors including previous water use data obtained through use of scheduling tools, visual crop appearance, weather, evaporation data and historical water use.

Surveyed growers do not tend to have measures of their water use efficiency. While some growers have had some work done by Growcom on the efficiency of their irrigation system, none seem to calculate the water use efficiency of individual crops in relation to their production.

Adoption of best management practices

Barriers to adoption

The benchmarking process also identifies some of the barriers to the adoption of best management practices. The cost of changing over to implement specific management practices is prohibitive to some growers. Specific examples highlighted by surveyed growers include the cost of converting the whole area of production to trickle/drip irrigation and the purchase of GPS guidance. While many would like to be able to implement this equipment to improve management practices, financially it is not currently feasible for these enterprises. In the case of trickle/drip the ability to reuse tape would help make it more viable to growers.

Some erosion control options are not feasible to growers due to the cost of productive land. Horticultural land prices in the region range from \$35-60,000 per hectare. Some management options would involve areas of productive land being removed from production. For example contours, revegetation along riparian areas. Growers cannot afford for this land not to be in production. This is also at odds with the need to increase land area under production to maintain viability as a business.

Training delivery

Growcom FMS

Of those growers surveyed to date, five have undertaken the Growcom FMS risk assessment for nutrient management, water use efficiency and water quality during the 2008/09 reporting period. Two of these growers are located in the Lockyer focal area. In total Growcom delivered their FMS risk assessment tool to eight growers in the Lockyer and Bremer catchments. At the time of this report we were still awaiting feedback on issues and further actions identified through this risk assessment process.

Controlled Traffic Farming project

At the time of this report two surveyed growers were co-operators in the Controlled Traffic Farming project. These growers are in the process of purchasing guidance and looking at options for CTF in their farming system. This project has also been discussed one-on-one with an additional 10 growers.

Trials and demonstrations

Of those benchmarked in total, to date 50% have been interested in co-operating with trial or demonstration sites. To date 35% have been involved in some sort of trial/demonstration or monitoring site. Of these, 15% have been in Healthy Country focal areas. The same 15% have also been involved in on ground works with SEQ Catchments.

Most trials sites to date have been with grower co-operators who are not normally involved in other QPIF activities such as field days or grower-cooperators with other QPIF researchers or extension.