CWFS 2001 Crop Monitoring Report

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The CWFS Crop Monitoring project now involves over 100 farmers and 300 paddocks. In 2001 around 190 paddocks were wheat and the remainder a variety of pulse, oilseed and other cereal crops. The 2001 season has seen the group develop its reporting back to farmers after each property visit as well as a series of final seminars during February. The results of the crop monitoring program were both interesting and informative with a lot of good feedback for all involved.

Information has been collected on the type of farming system used, rotations, varieties, fertiliser types, seed placement, machinery, points, covering devices, paddock operations, crop growth (including crop emergence, tillers and heads), weeds, disease, chemicals, gross margins, marketing, yield performance, water usage and many other aspects of crop performance across the season. *If you would like to include your property in this program please enrol by ringing LwdyMoon on (02) 68975 225.*

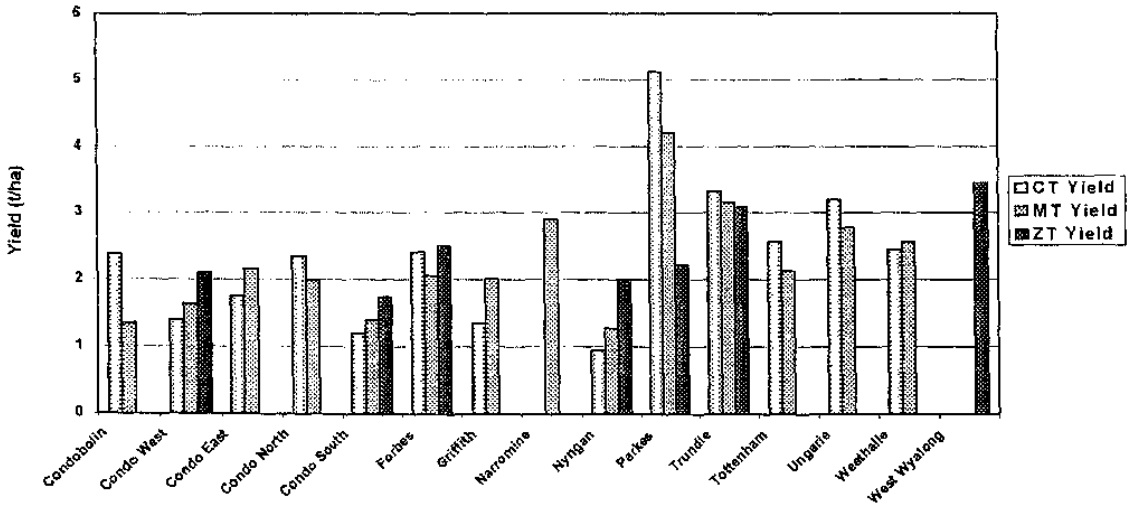
Farming System Comparison

Concentrating on the wheat crops alone, paddocks were split into three types of farming systems:

1. *Conventional tillage;* 3 or more workings were performed prior to the crop being sown.
2. *Minimum til/age;* 1 to 3 workings prior to the crop being sown.
3. *Zero tillage;* the paddock was not cultivated prior to the crop being sown.

Figure 1 shows a combination of most of these systems being used in each district, along with that system's average yield across all areas where monitoring is carried out.

Figure 1: Area Yield vs Tillage System



On closer inspection of the data, it is apparent that in areas which had above average rainfall, or a good season, conventional till paddocks were considerably better than zero till. In drier areas the zero tillage performed better. Minimum till paddocks are generally more popular in number but did not perform as strongly in 2001. The following Table 1 shows the comparison between the systems over the entire crop monitoring district.

Table 1 : Conventional vs Minimum vs Zero Tillage?

Averages	Conventional Tillage	Minimum Tillage	Zero Tillage
No. of paddocks	48 paddocks	107 paddocks	22 paddocks
Yield	2.33	2.10	2.55
Protein %	12.2	11.7	11.5
Screenings %	2.2	2.1	2.4
Test Weight (kg/hi)	84.6	79.99	83
Cost of Production ($/ha)	164	160	170
Income ($/ha)	460	408	489
Gross Margin ($/ha)	296	248	319

In this table, yield and protein differences are interesting, in that conventional paddocks on average achieved higher protein and minimum till paddocks had slightly lower yield. Screenings and test weights were similar, again with minimum till being at the lower end of the scale. The data has not been statistical analysed and these results may not be significantly different.

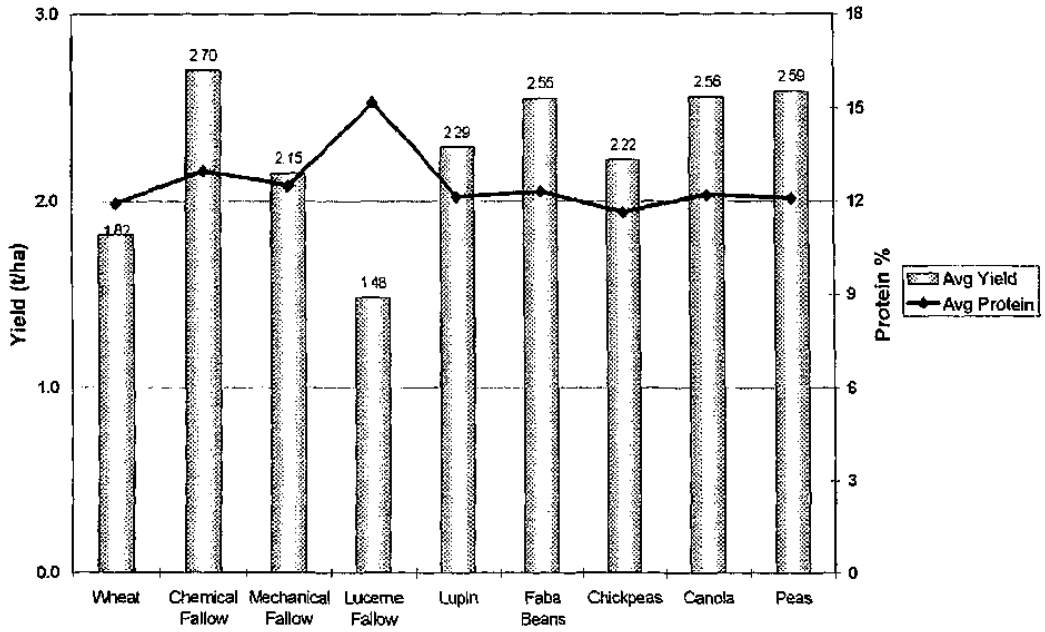
Gross margin figures were interesting with only marginally more money being spent on zero till wheat crops than conventional or minimum till. The zero till crops, however, also achieved higher incomes and thus higher gross margins ($/ha) (i.e. the average of wheat sown by zero till cost $10/ha more than the average of minimum till wheat crops but grossed $71/ha more than the minimum till crops).

Rotations

Being located in an area that has such diverse seasons and rainfall, it has always been found that no individual system works all the time. Likewise, every farm makes use of a different cropping rotation. As a general guide, an average rotation for the area would be 3 years of cereals followed by 4 years of pasture, but most farmers vary this as needed after taking into account weeds, area to be cropped, moisture, presence of good stock feed, and the farming system used. An increasing number of farmers are trying oilseed and pulse crops. The Forbes and Parkes areas have been growing these for some time. As a result, the cropping cycle is being extended by one to two years and the pasture phase is often shortened. Figure 2 shows the productivity of growing wheat after a range of different crops.

Notice that wheat grown on chemical fallow achieved the greatest average yield in 2001 with wheat grown after canola, peas and faba beans finishing with a similar yield. Other fallows and lucerne pasture fallows have been separated to demonstrate that not all fallow crops can be considered equal. The lucerne pasture fallow has a lower wheat yield than any other crop but has much greater protein (i.e. 15% protein) to counteract the yield loss. The extra protein seems to reflect the extra nitrogen available from the lucerne and the lower yield may be a result of a decrease in subsoil moisture after lucerne growth, particularly if lucerne control during summer rain periods was difficult,

Figure 2: Yield and Protein of Wheat Following...



Wheat grown on wheat stubble had the second lowest yield. This may be attributed to moisture availability, disease such as take all, rhizoctonia, yellow leaf spot and crown rot - which are not always obvious - and weeds such as ryegrass and wild oats. It is also apparent that lower fertiliser rates are generally used where wheat on wheat rotations are utilised compared with farmers growing pulse or oilseed crops which require higher levels of fertiliser and often more intensive management skills.

Varieties

Janz is still the most popular wheat variety grown in the central west due to its ability to produce good quality high protein wheat with worthwhile yields. It is also one of the few varieties suited for growing in this area that is accepted as Prime Hard (protein

greater than 13%). Cunningham and H45 are also popular varieties although H45 is not a prime hard wheat variety. The northern half of the crop monitoring area has a summer dominant rainfall pattern which tends to be better suited to growing early wheat varieties such as Sunstate and Sunbrook, which are capable of producing some very favorable gross margins of over $400 per hectare (Table 2). The gross margins were calculated as an average across the number of paddocks sown to that variety. In the south, early sowing tends to be penalized through frost damage. There were 2 farmers who continue to supply Hartog wheat to fill contracts for mills, which under the standardisation of gross margin figures for this project received a low level gross margin. Actual contracts may be considerably healthier than these figures indicate.

Other varieties grown were; Babbler, Batavia, Chara, Lang, Miskle, Mulgara. The number of paddocks was not adequate to include these results in Table 2.

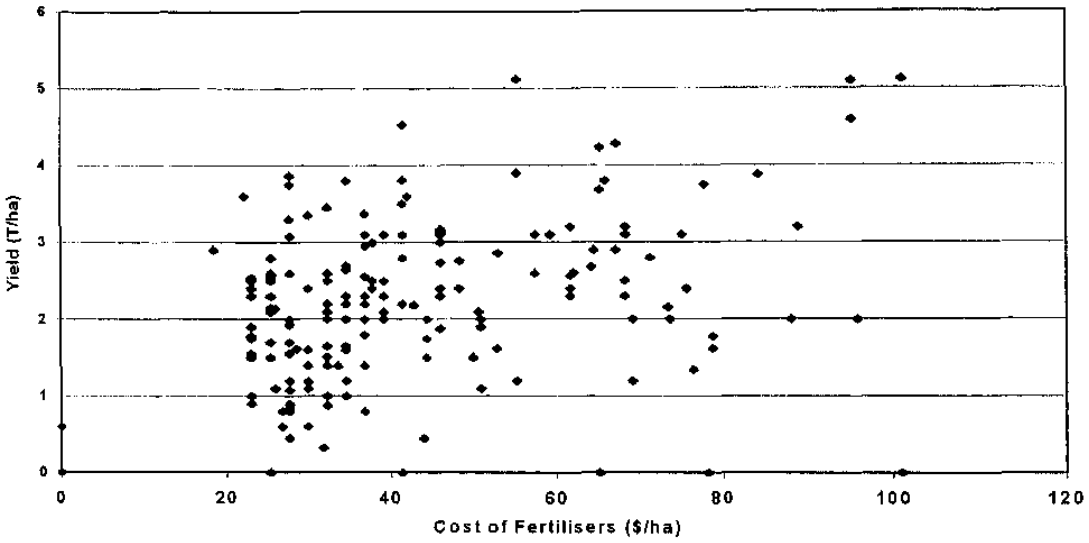
Table 2: Varietal Details for 2001

Variety	No. of Crops	Avg Yield (t/ha)	Avg Protein %	Avg Gross Margin ($/ha)
Cunningham	27	2.66	12.4	356
Diamondbird	13	2.17	11.8	241
Dollarbird	3	2.05	12.5	231
H45	25	2.27	11.6	260
Hartog	3	1.03	14.7	95
Janz	37	2.24	11.3	279
Kennedy	7	1.34	12.8	135
Strezlecki	7	2.31	11.8	265
Sunbri	3	1.87	11.5	197
Sunbrook	6	2.92	12.0	403
Sunco	8	1.75	12.5	197
Sunmist	3	3.08	11.0	414
Sunstate	16	2.24	13.1	284
Sunvale	7	1.58	12.1	191

Fertiliser Usage

MAP and DAP are the most common fertilisers being used, with marginally more growers using MAP. There were also 7% of wheat paddocks using other fertilisers such as Granulock 12, Triple super, BioAgPhos or blends. 23% of the wheat paddocks monitored had urea applied and a further 7% used other forms of nitrogen fertilisers such as Big N (anhydrous ammonia) or sulphate of ammonia. The cost of the fertilisers as applied to the monitored wheat crops has been graphed below (Figure 3).

Figure 3: Yield vs Fertiliser Cost

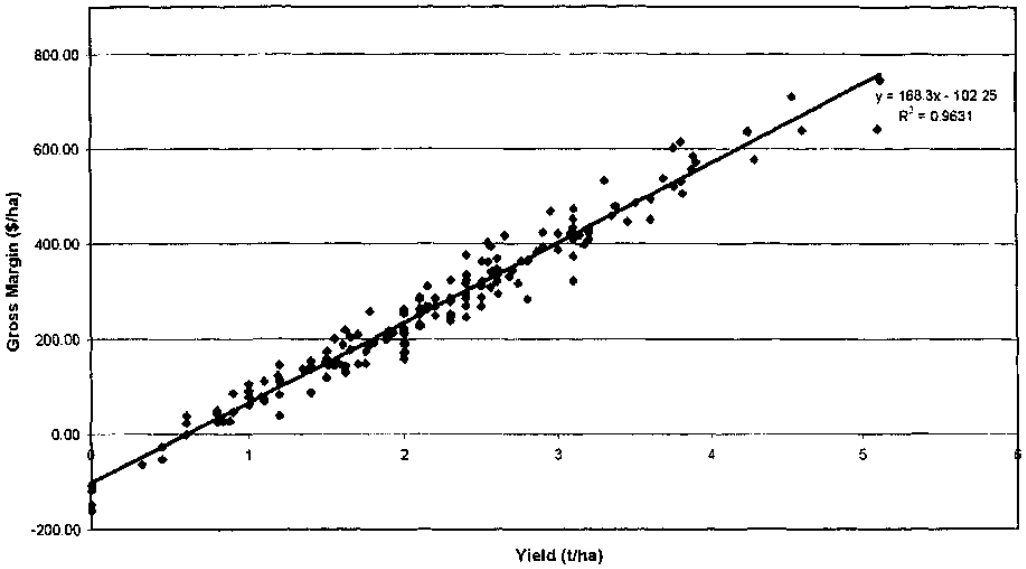


Using Figure 3, if we take a fertiliser cost of $40/ha, the yield achieved can range from 2 t/ha to 4.5t/ha (excluding the Ot/ha result). Likewise, for crops that yielded above 4t/ha, farmers spent anywhere from $40- $100/ha for a similar yield. Indeed many farmers are achieving excellent results with less than $40/ha being spent on fertiliser. Soil tests, improved agronomic advice and improving pastures may have contributed to this result, with many farmers tailoring fertiliser rates to suit their paddocks rather than applying blanket rates across all cropping paddocks. Frost and hail damages have also left their mark across the area with a number of crops not being harvested (0 t/ha yield figures).

Gross Margins

While many references have been made to the gross margins of different wheat crops monitored in the program, it should be noted that all paddocks monitored have all costs and income standardised to allow more effective benchmarking across the area. This is calculated using the NSW Agriculture 'Farm Budget Handbook 2001 for Central NSW - Winter Crops' by Dean Patton and Colin Mullen. This handbook is readily available at any NSW Agriculture office and most agronomic advice centres.

Figure 4: Yield vs Gross margin

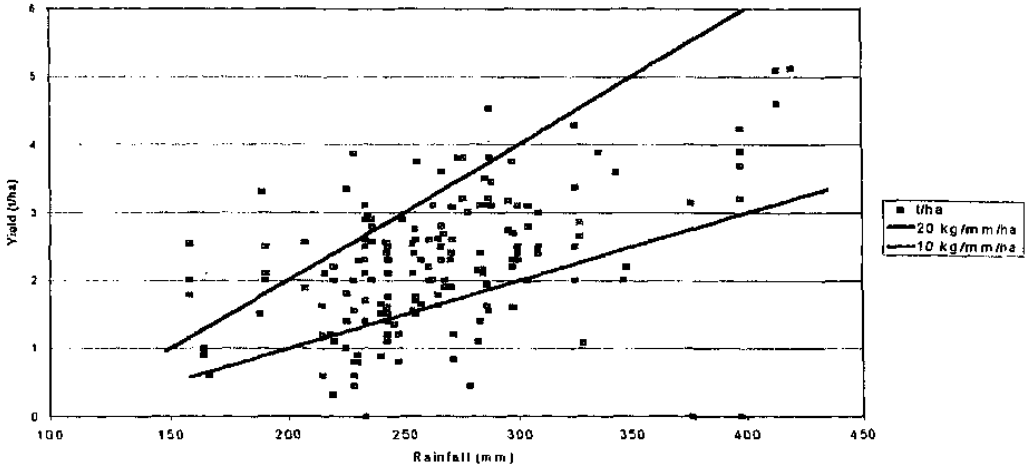


The easiest way to achieve a healthy gross margin is to achieve a healthy crop yield. Figure 4 demonstrates that wheat yield is directly proportional to the gross margin achieved. Advice from Forbes district agronomist, Ken Motley, indicates that this trend is apparent in most crops. In saying this however, it is necessary to note that there is still great variation along this curve. For example, at a yield of 2.5 t/ha, eight paddocks achieved gross margins from $250/ha up to $380/ha, a difference of over $150/ha. With this variation apparent there are obviously ways of achieving the same yield with either lower inputs or by receiving higher income to obtain a more favorable gross margin.

Water Usage

Final yield data has been related to total available water (Figure 5).

Figure 5: Yield vs Rainfall (including Fallow)



In figure 5 the two lines represent Water Use Efficiency (WUE), which is an indicator of the amount of grain (in kilograms) produced from 1 millimetre of moisture over 1 hectare of land. The moisture includes rainfall and stored soil moisture. Wheat in the central west that achieves a water use efficiency of 15 kg/mm/ha is considered very good, with anything above 20 kg/mm/ha being considered excellent.

The top line on Figure 5 represents a WUE of 20 kg/mm/ha and the bottom line a WUE of 10 kg/mm/ha. The majority of wheat paddocks monitored were able to achieve water use efficiencies above 10 kg/mm/ha. Over 20 paddocks achieved excellent WUE. A WUE greater than 20 kg/mm/ha means that those 20 crops were healthy enough and had a root system capable of extracting as much water as possible from the soil. Nutrition, particularly phosphorus plays an important role in achieving better water use efficiency. However, do not exclude simple agronomy like sowing the right variety for your area, sowing on time (which also means having the crop emerge in time) controlling weeds, diseases and pests. By generally ensuring that your crop is healthy and strong, it is capable of extracting and utilising all available moisture and nutrients and thereby achieving the best yield possible.

Overall, the information shown in this report is only a very small portion of what is available from the crop monitoring program. As each year progresses we are able to make more use of this information and are able to be more concise with each detail. For the farmers involved, the paddock cards provide an excellent record of every paddock monitored, which will have added benefits when programs such as quality assurance start to take effect. Being able to compare your own paddock activities and crop responses to those of your neighbours and your general district has great implications for building and improving your farming enterprise. *If you would like to include your property in this program please enrol by ringing JJndy Moon on (02) 68975 225.*