

2003 Crop Monitoring



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Key Points

- The Tottenham area seemed to have the best season in the central west.
- The huge seasonal variation across the central west in 2003 overshadowed any other effects in the data.

Background

CWFS has been conducting crop monitoring, sponsored by AWB, since 1999. In the early years, perfecting the system caused most problems and in the last few years, drought and the huge variation in seasonal conditions across the central west has caused the greatest problems. In 2003 most crops were harvested which will allow further statistical analysis of the data. In 2002 extra statistical analysis was planned but the high number of crops not harvested gave an incomplete data set making further analysis not worthwhile.

The Crop Monitoring program is a modification of the TopCrop program. Interested farmers enrol in the program and CWFS employs people to monitor their crops throughout the season. Wheat

is always the dominant crop monitored but the program is open to any crops. The monitors visit the farm 3 times a year and collect information that is entered into a computer and analysed. After harvest, the farmers fax in their harvest details, completing the data collection. Early in the next year an information session is held for those who were a part of the program. Each paddock receives a code so that data is kept anonymous and all data is returned to those enrolled in the program.

A Selection of Results

There were 192 crops in the 2003 season. 125 of these were wheat (65%). Table 1 gives the breakdown of crops. Of the 192 paddocks, 180 of them were harvested (94%).

Table 1: Number of crops in 2003 Crop Monitoring

Crop	Number of paddocks
Wheat	125
Barley	34
Canola	16
Field Peas	5
Lupins	6
Triticale	1
Oats	3
Chickpeas	2

Crop Information

Wheat

22 varieties of wheat were sown. H45 was the most popular variety (21 of the 125 paddocks). Chara (15), Cunningham (11), Janz (11), Strzelecki (10) and

Sunstate (10) were also popular. Other varieties included - Babbler (2), Batavia (3), Bowerbird (1), Diamondbird (9), Dollarbird (3), Durum (1), Kennedy (1), Lang (1), Sunbri (1), Sunbrook (7), Sunco (2), Suneca (1), Sunvale (7),

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Whistler (1), Wylah (6) and a mixed paddock of Miskle/Chara. 62% of wheat crops were APH varieties.

Wheat crops were grown following - a wheat crop in 2002 (39%); fallow (16%); pasture (15%) and canola (15%). Sowing rates ranged from 25 kg/ha to 80 kg/ha. Wheat was sown from the 18th March 2003 up until the 13th August 2003. Seed was planted at an average depth of about 5 cm (2 inches) but anywhere from 1 cm to 15 cm. Plant densities ranged from 36 plants/m² to 215 plants/m². Wheat paddocks had between 0 and 70 kg N/ha, 0 to 30 kg P/ha and 0 to 3 kg S/ha applied as fertiliser.

The average number of plants at establishment was 95 plants/m². The average number of in-crop sprays (herbicides, insecticides, etc.) was 0.7. The average number of heads/m² was 301 and the average number of grains/head was 33. The average harvest data was 24th November and wheat yielded, on average, 1.7 t/ha, with 13.7% protein, 7.1 screenings and a test weight of 79.2. The average growing season rainfall was 147 mm.

Barley

Half of the barley sown was Schooner (17 of the 34 paddocks). Other varieties included Gairdner (9 paddocks), Galaxy (1), O'Connor (2), Sloop (1), Tilga (3) and Wyalong (1).

In 2003 barley was most commonly grown (26%) following wheat (45%). Sowing rates ranged from 22 kg/ha to 75 kg/ha. Barley was sown from the 29th April 2003 up until the 15th July 2003. Seed was planted most commonly at about 4-6 cm but anywhere from 2 cm to 8.5 cm. Plant densities ranged from 39 plants/m² to 210 plants/m². Barley paddocks had between 4 and 57 kg N/ha, 6 to 27 kg P/ha and 0.6 to 5.5 kg S/ha applied as fertiliser:

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The average number of barley plants at establishment was 89 plants/m². The average number of in-crop sprays was 0.5. The average number of heads/m² was 471 and the average number of grains/head was 22. The average harvest date was the 19th November and barley yielded, on average, 2.0 t/ha, with 13.6% protein, screenings of 6.9 and a test weight of 70. The average growing season rainfall was 150 mm.

Canola

Canola varieties included - 1 paddock each of 44C73, another Clearfield type (variety not given), Hyola (unknown number) and Hyola 43, Ag-Outback and Surpass 400. 2 paddocks each of ATR-Beacon and ATR-Grace. 3 paddocks each of Rainbow and Surpass 501 TT.

In 2003 canola was most commonly grown after a 2002 wheat crop (50%). Sowing rates ranged from 1.8 kg/ha to 4.5 kg/ha. Canola was sown from the 10th April up until the 4th June, with one paddock sown on the 17th July. Seed was planted at a depth ranging from 1 cm to 5 cm. Plant densities ranged from 12 plants/m² up to 91 plants/m². Canola paddocks had between 9 and 56 kg N/ha, 0 to 35 kg P/ha and 0 to 76 kg S/ha applied as fertiliser.

The average number of canola plants at establishment was 46 plants/m². The average number of in-crop sprays was 1.3. The average number of pods/m² was 1909 and the average number of grains/pod was 12. The average harvest date was 20th November and canola yielded, on average, 0.9 t/ha. The average growing season rainfall for the canola paddocks was 163 mm.

Chickpeas

There were 2 chickpea paddocks (both at Nyngan) and both grew Jimbour chicks. Both were sown following a wheat crop in 2002. One crop was sown at 50 kg/ha,

the other at 60 kg/ha. The average number of in-crop sprays was 35. The average yield was 0.7 t/ha

Field Peas

The 5 paddocks of peas had 1 paddock of Morgan and 2 each of Excell and Parafield. Three field pea crops followed cereals in 2002 and the fourth was after a fallow. Sowing rates ranged from 73 kg/ha to 100 kg/ha. Field peas were sown from the 22nd May up until the 20th July. Seed was planted at a depth ranging from 3 cm to 7 cm. Plant densities ranged from 25 plants/m² to 48 plants/m². Field pea paddocks had between 6 and 14 kg N/ha, 12 to 15 kg P/ha and 0.8 to 1.5 kg S/ha applied as fertiliser

The average number of pea plants at establishment was 35 plants/m². The average number of in-crop sprays was 14. The average number of pods/m² was 138 and the average number of grains/pod was 4.5. The average harvest date was the 15th November and field peas yielded on average, 1.1 t/ha. The average growing season rainfall was 126 mm

Lupins

There were 6 lupin paddocks - 4 paddocks of Wonga marrow leaf lupins and 2 of Albus lupins (no variety given). Four lupin paddocks followed a cereal in 2002 and the others were after pasture. Sowing rates ranged from 80 kg/ha to 100 kg/ha. Lupins were sown from the 10th April up until the 10th May. Seed was planted at a depth between 5 - 6 cm. Plant densities ranged from 21 plants/m² up to 78 plants/m².

The average number of lupin plants at establishment was 51 plants/m². The average number of in-crop sprays was 1.8. The average number of pods/m² was 387 and the average number of grams/pod was 3.4. The average harvest date was the 16th November and lupins

yielded on average, 0.7 t/ha. The average growing season rainfall for lupin paddocks was 128 mm.

Oats

1 paddock each of Bimbil, Yarran (both dual purpose) and Echidna (grain only). All oats were grown following a cereal in 2002. Sowing rate ranged from 25 kg/ha to 40 kg/ha. Average yield was 1.5 t/ha.

Triticale

1 paddock of Muir triticale was in the crop monitoring, yielding 1.0 t/ha.

Other Information

Paddock Size

Paddock sizes in 2003 ranged from 10 ha to 445.5 ha, with an average of 112 ha.

Stubble

Most crops were sown into minimal levels of stubble residue. This was due to the low yields of 2002 and the little remaining stubble. It was not contributed to by stubble burning and/or cultivation.

Summer weed control and/or fallowing
Spraying (47%) and cultivation (43%) were split almost evenly as the choice for initial summer weed control and/or fallowing. As the summer progressed, more spraying occurred than cultivation. The number of fallow/summer operations (i.e. sprays, cultivation, grazing, burning, pre-sowing fertiliser application) ranged between 0 and 6 operations, with an average of 2.3 operations.

Spraying

The number of spray operations before sowing ranged from 0 to 4. No pre-season spraying was carried out on 22% of paddocks. 37% of paddocks had 1 chemical application before sowing, 34% of paddocks had 2 chemical applications before sowing, 7% of paddocks had 3 chemical applications before sowing. Only 1 paddock had 4 chemical applications before sowing. It appeared

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that these could be grouped into distinct areas, suggesting that summer fallowing options and spraying was largely a function of rainfall opportunities.

Cultivation

The number of cultivations before sowing ranged from 0 to 3 workings. 44% of paddocks were sown using no cultivation (no tillage). 51% of paddocks used 1 or 2 cultivations before sowing (minimum tillage). 5% of paddocks used 3 cultivations (conventional tillage).

The 2001, 2002 and 2003 crop monitoring data shows a decline in the number of cultivations before sowing. It is tempting to conclude that there is a change towards minimum tillage in the central west, but I am hesitant to make that conclusion as the drought may have affected these figures. I am keen to see how these figures will look after a few years of average rainfall.

Fertilisers

MAP is the most commonly used fertiliser (42%) with DAP (23%) and urea (11%) also popular. 27 different fertilisers were used.

In 2003 the amount of N supplied to crops from fertilisers ranged between 0 kg N/ha and 70 kg N/ha, with an average of 14.5 kg N/ha. The amount of P supplied to crops from fertilisers ranged from 0 to 35 kg P/ha, with an average of 15 kg P/ha. The amount of S ranged from 0 to 76 kg S/ha, with an average of 2 kg S/ha (Gypsum contains S, so gypsum applications account for the very high levels of S applied). In 2002 and 2003, rainfall was the greatest limiting factor to yield and as such has overshadowed the relationship between fertiliser applications and crop yield.

Seed and Sowing

91% of paddocks were sown with graded seed. 76% of paddocks used seed that had been treated with a seed dressing. Sowing dates for each zone appear in Table 2.

Table 2. Sowing date and Wheat Yields for each area in 2003 Crop Monitoring

Zone	Sowing Dates	Wheat Yield t/ha
Alectown	scattered from 16 th April to 27 th May	0.87
Bedgerebong	one 30/5; others in July	0.37
Bogan Gate	late June/July	1.42
East Condobolin	two in late April/May; rest in July	1.03
Forbes	one in May, one in June, rest in July	1.30
Gunningbland	July	0.37
Mandagery	two in March, rest from 3 rd May to 16 th June	1.85
Merriwagga	20 th April to 26 th May	2.34
North Condobolin	18 th April to 20 th May	1.55
Nyngan	16 th April to 27 th May	1.29
Parkes	June and July	0.78
Rankins Springs	scattered from 29 th April to 11 th July	1.90
South Condobolin	one on 1 st April; rest in July to 13 th August	1.04
Tottenham	scattered from 17 th April to 30 th June	2.39
Trundle	10 th April to 8 th May	2.60
West Condobolin	scattered from 30 th April to 15 th July.	0.86
Total Average Yield		1.65

84% of paddocks were sown with an airseeder. Harrows are the most popular choice of covering device (43%), although there are a range of harrows used (finger, rotary, 1 leaf, prickle, etc.). 30% of paddocks had press wheels used as the covering device and 18% used prickle chains.

Early weeds

Ryegrass, capeweed and black oats were the dominant weeds at plant emergence. Also present were skeleton weed, Paterson's curse, mustard, fumitory, saffron thistle and unknown broadleaf weeds. Weed scores were in the range of low to medium numbers.

Soil moisture

If soil moisture was measured and noted, it was at a depth of 40 to 60 cm, although this was only noted on about 10% of paddocks.

The 2003 season

The huge spread of sowing dates is the most outstanding feature of the season. Sowing started in March and finished by August. This is 2 months later than the usual end date. In many areas of the central west, sowing conditions were drier than optimum and the season remained quite dry. In some areas, a run of exceedingly hot and dry days in September ruined many crops as they were trying to fill. In other areas frost caused damage to the crops with many heads and pods not filling well and some not at all. As an area, Tottenham seems to have had the best season with most crops having high numbers of grains/head (or

pod) and high yields. The following page shows the data averages for all cropping zones combined. Individual zone results will be published in a CWFS Newsletter. Table 2 shows the variation in sowing dates and wheat yields as an example of variations across the whole region.

General Observation

Many of the NSW Agriculture District Agronomists are carrying out Plant Population trials looking at sowing rate, establishment counts and measuring seed size and germination percentages. They have noticed that there are some farmers not getting good establishment counts from a selected sowing rate. The crop monitoring data supports these observations. For example, at a sowing rate of 35 kg/ha the establishment of wheat plants ranges from 40 to 100 plants/m². The crop monitoring data does not measure seed size or germination percentages and can therefore make no suggestions as to why there are these differing establishments. The work of the NSW Agriculture DA's on the plant population trials will be very interesting to see if the factors causing these differences can be identified. If you are concerned about your establishment counts, see your local DA.

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If you would like to be a part of the 2004 Crop Monitoring program, please ring BRENDA CARR (phone 6895 1025 at work) to enrol. The cost of the program is \$110 and 3 paddocks are monitored per farmer.

CWFS 2003 Crop Monitoring Data Summary

All Data for all areas	2003 Crop												Grand Total
	Barley	Canola	Chickpeas	Field Peas	Lupins	Oats	Triticale	Wheat					
Total Number crops sown	34	16	2		5	6	3	1	125				192
Total Number crops harvested	32	14	1		5	6	3	1	118				180
Total Average number fallow cultivations	1	1	1	1	1	1	1	0	'1				1
Total Average number fallow sprays	1	2	3		2	2	1	1	1				1
Total Average of total fallow costs (\$/ha)	13.64	26.60	30.65		19.35	27.15	12.34	8.40	19.77				19.41
Total Average date of sowing	29/5/03	15/5/03	15/5/03		15/6/03	24/4/03	26/5/03	11/5/03	26/5/03				25/5/03
Total Average sowing rate kg/ha	43.18	3.23	55.00		85.60	91.17	32.33	40.00	44.58				43.30
Total Average row Spacing (cm)	24.13	27.17	48.30		27.56	25.46	23.29	30.00	23.02				24.05
Total Average seed costs (\$/ha)	17.97	11.29	55.00		42.80	34.64	17.95	0.00	19.30				19.74
Total Average N applied (kg/ha)	13.46	29.49	9.00		8.67	11.34	7.93	10.80	14.09				14.44
Total Average P applied (kg/ha)	15.48	20.44	10.00		14.13	12.60	10.25	12.00	14.60				14.88
Total Average S applied (kg/ha)	1.35	13.28	1.00		1.13	1.26	0.93	1.20	1.15				1.85
Total Average fertiliser cost (\$/kg)			23.50				23.50	28.20					
Total Average in-crop herbicide cost (\$/ha)	10.26	13.11			12.53	12.52	1.36	4.42	11.26				11.05
Total Average number of in-crop sprays	0.53	1.25	3.50		1.40	1.83	0.33	1.00	0.71				0.80
Total Average Plant density (p/m ²)	88.76	45.59	17.65		34.69	50.50	72.69	50.70	94.67				85.17
Total Average number of Tillers/m ²	578.42						328.80	184.67	396.32				431.77
Total Average Heads (or pods)/m ²	470.68	1909.30	223.36		137.60	386.99	253.03	145.33	301.09				434.85
Total Average number of Grains/head	21.47	12.16	1.40		4.48	3.38	35.13	39.60	33.18				27.56
Total Average date of harvest	19/11/03	20/11/03	25/11/03		15/11/03	16/11/03	14/11/03	21/11/03	24/11/03				22/11/03
Total Average Yield t/ha	2.00	0.86	0.70		1.09	0.74	1.47	1.00	1.65				1.59
Total Average Protein	13.63	28.43							13.72				14.03
Total Average Screenings	6.88	2.21							7.14				6.68
Total Average Hectolitre Weight (Test Weight)	70.00	66.46				76.00	45.00		79.15				76.32
Total Average 2003 total rainfall	359.99	425.53	300.00		297.20	381.84	355.17	269.50	374.00				372.55
Total Average Growing Season Rainfall	150.15	162.97	106.00		125.90	127.75	129.00	80.50	146.94				146.62
Total Average Stored Fallow Rainfall	86.93	110.81	110.65		77.42	135.23	96.58		96.30				96.67
Total Average WUE (Cornish & Murray method)	10.59	4.12			5.90	3.71	8.35		8.66				8.39
Total Average Income (\$/ha)	281.71	298.54	157.50		273.00	185.83	190.67	130.00	314.34				297.54
Total Average Expenditure (\$/ha)	107.89	154.98			112.67	155.88	80.15	66.02	112.39				113.70
Total Average Profit/Loss (\$/ha)	168.29	152.12			132.34	99.12	110.51	63.98	192.92				181.14
Total Average paddock size(ha)	96.35	56.25	85.13		69.80	91.24	129.67	121.50	127.03				112.67