

Nyngan CWFS Site 2001 Results

Greg Brooke, NSW Agriculture, Nyngan.

Observations from the Nyngan District

Greg Brooke, NSW Agriculture, Nyngan, presented the Nyngan CWFS trial results at the CWFS Seminar in March 2002. He also made comment on the popularity of conservation farming in the Nyngan district. About 20% of the area is direct drilled, with the majority of this in controlled traffic laneways. There is also controlled traffic used in some minimum till systems. Local observations are that the soil is improving and the crops are improving.

Observations from the trials, and Nyngan district in general, are that direct drilling wheat is as good as cultivation and pulses are economic in their own right. In the trials the wheat has been better after canola than after pulses. Results with applying N have been unreliable, and P is proven to be very valuable (up to 20kg P/Ha). District average is now at least 75kg/Ha of DAP applied. Greg reinforced the basics - timeliness, nutrition, weed control and soil management. He pointed out that it costs \$10/Ha for every one day delay in sowing wheat.

Background

The trial site is on representative hard setting red clay loam soil and is situated 12km west of Nyngan.

The aims of the trial site at Nyngan have been to assess the economic and agronomic benefits of a range of pulse and oilseed rotation crops and their flow-on benefits to wheat. Trials and now commercial paddocks have shown the viability of both in a crop rotation sequence.

The trial site is now used for further fine-tuning work such as time of sowing trials and crop nutrition as well as to evaluate how long paddocks can be continuously cropped, with wheat

yield and quality being the main yardstick (aiming for at least 2t/ha with at least 12.5% protein).

The trial site has been running since 1999 when it was first cropped after a long fallow (1998) which had followed three crops of wheat (1995 to 1998). This year will mean the 7th crop year in 8 years for the trial site, Trials are sown over the preceding year's trials using direct-drilling techniques in a three way rotation between wheat, canola and pulses. The exception to this is where wheat or barley are sown into wheat stubble for the sake of comparison,

Major Soil Characteristics (0-10cm) (April 2001)

pH(1:5CaCl ₂)	5.0	Cation Exch. Cap. Meq/100g	9.76
pH (Water)	5.9	Ca/Mg ratio	3.36
Organic carbon %C	1.2	Al saturation%	1.3
Nitrate Nitrogen mg/kg	40	Sodium % of cations (ESP)	0.10
Phosphorous (Colwell)	14		
Sulfur	7		

Wheat Varieties Comparison**Method**

Treatment: Wheat after wheat after Canola.

Sowing date: 27th April 2001

Seeding rate: 35 kg/ha

Fertiliser: DAP Sulphur was sown below the seed at a rate of 100kg/ha with the exception of one additional section of Sunmist which was sown with 200kg/ha DAP Sulphur.

Stubble treatment: Cool burn prior to sowing removed 80% of stubble residues.

Seeding device: 14 inch row spacing with spear points. Fertiliser deep banded below seed. Narrow press wheels.

Subsoil moisture: 80cm

Results (averaged)

Variety	Fertiliser Rate	Yield t/ha	Protein %	Screenings
Sunbrook	100 kg/ha DAPS	3.17	11.2	3.4
Cunningham	100 kg/ha DAPS	3.08	13	3.4
Sunvale	100 kg/ha DAPS	3.00	11.4	4.3
Sunmist	*200 kg/ha DAPS	2.92	13.6	5.6
Sunmist	100 kg/ha DAPS	2.89	12.8	4.2
Sunstate	100 kg/ha DAPS	2.87	11.6	4.0
Sunkota	100 kg/ha DAPS	1.55	14.4	2.8

Variety differences were not statistically significant other than the lower yielding Sunkota which was the most severely affected by Yellow leaf spot. Despite the early sowing of several of these varieties, frost was of minor significance in this year.

Discussion

Disease pressure with wheat on wheat was moderate in June - July from Yellow leaf spot with some reduction in leaf photosynthetic area. Sunkota quite badly affected.

Having suffered Yellow leaf spot damage and then going into a dry spring probably caused the considerably inferior yield in Sunkota.

Hail damage occurred during grain ripening stages to varying degrees in different varieties but was estimated to be around 20% - Sunstate being the most mature was slightly worse affected.

Topdressing Wheat Varieties

Method

Urea topdressed on 22nd August aiming for protein increase.

Three treatments: Nil, 25 units N, 50 units N. Crop stage:

Booting.

Results

Wheat topdressing trials

Variety	Nitr'n rate	Yield t/ha	Protein	Screening
Sunmist 200kg DAP Sulfur	50	3.22	13.1	6.3
	25	3.27	13.8	5.8
	0	3.46	13.6	5.6
Cunningham 100kg DAP S	50	2.93	13.0	3.7
	25	3.13	12.4	3.3
	0	3.20	13.0	3.4
Sunvale 100kg DAPS	50	3.68	12.5	3.7
	25	3.18	12.6	3.7
	0	2.93	11.4	4.3
Sunbrook 100kg DAPS	50	3.40	11.7	3.9
	25	3.52	11.7	3.1
	0	3.21	11.2	3.4
Sunmist 100 kg DAPS	50	3.40	12.0	5.0
	25	3.32	11.8	4.3
	0	3.15	12.8	4.2

Results were not conclusive, probably due to late topdressing stage and little rain following (5 mm).

Wheat Fertiliser Rate Demonstration

Method

-3 rates of DAP Sulfur (16N; 18P; 12S) were used: 150, 100 and 50 kg/ha of product. - Wheat variety was Sunmist sown on 27th April.

Results

Average yields (t/ha) were as follows:

Fert rate kg/ha	Yield t/ha
150	2.61
100	2.26
50	2.13

There was a clear trend of higher yield with increased fertiliser rates.

Discussion

Five years ago the average fertiliser use in wheat at Nyngan was only 40kg/ha DAP.

The average is now more like 75kg/ha. These trials and others have shown that starter

fertilisers more than double return on expenses at rates up to 25 units of Phosphorous(P). All the trials have been conducted on sites with medium P fertility levels and good subsoil moisture (ie > 80 cm wet soil).

Wheat Seeding Rate Demonstration

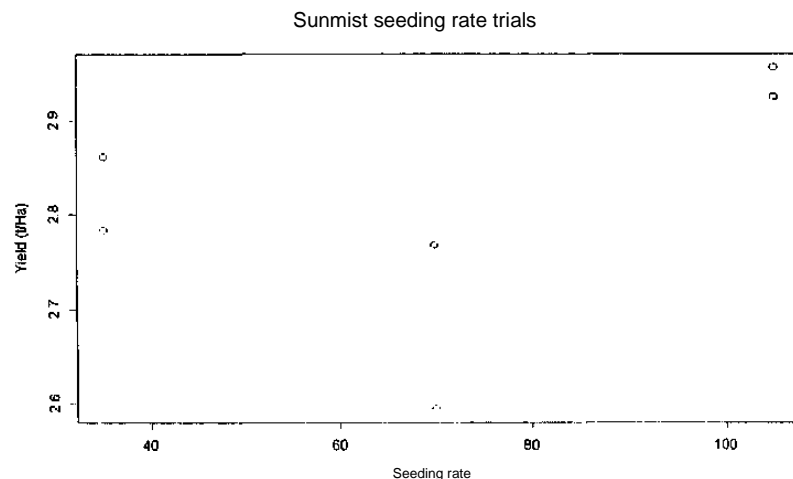
Method

Variety: Sunmist
Sowing rate: 35kg/ha, 70kg/Ha and 105kg/Ha
Fertiliser rate: 100kg/ha DAP Sulfur
Sowing date: 27th April 2001

Three rates of seed were used to test the validity of using heavier seeding rates. These rates were 35kg/ha (district standard), 70kg/ha (double district) and 105kg/ha (3 times district standard).

Results

Seeding rate	Yield t/ha	Protein %	Screenings%	Grain N removal kg/ha
105	2.925	11.2	3.6	57.33
70	2.767	12.1	4.0	58.59
35	2.783	12.2	4.3	59.42



Discussion

Yield was maintained with the higher sowing rates even with the dry season. Screenings were not affected. Protein levels were not consistent. Interestingly a grain nitrogen removal audit showed very similar removal rates despite differences with higher yield and lower protein in the heavier seeding rate.

A trial was also undertaken in 2000 with seeding rates in conjunction with various fertiliser rates with Sunbrook wheat to test a hypothesis that using heavier seeding rates would lead to less tillers and better grain quality. This was not the case. This trial showed that around 40kg/ha was around the optimum but up to 120kg/ha of seed gave no yield or quality penalty, but also no real advantages by these measures.

The usefulness of this information could be in situations where severe grass weed competition is anticipated and a dense crop could be established to increase competition against weeds.

Canola Time of Sowing Trial

Background

The aim of this experiment is to continue to build information regarding ideal time of sowing canola.

In the last few seasons canola has yielded best from April sowings. Last season best yields came from very early April sowing with mid-maturing types. Eg Rainbow and Oscar.

Method & Results

Fertiliser: 90kg/ha MAP plus 100kg/ha Canola Gold (39N; 19.8P; 17.8 S)

Variety	Early 27 April		Late 9 May	
	Yield(t/ha)	Oil%	Yield	Oil%
Rainbow	1.06	36.6	1.25	36.5
Oscar	1.00		0.96	37.4
Emblem	1.04	36.4	0.98	35.9
Scoop	0.83	40.1	0.88	
Mystic	1.04	38.5	1.26	38.3

Discussion

Hail in early October negated the effect of early sowing due to increased shattering losses in the early canola over the later sown canola.

Aphids were very damaging in the podding stages and would have significantly reduced yield and possibly oil content also.

Pulse Yield Comparison

Method

A range of pulses were sown on the 27th April.

Fertiliser: 90kg/ha MAP (9N; 19.8P;2S)

Results

Average Yields (t/ha) were as follows:

Ultra lupins	1.69
Dundale Field pea	1.39
Excell Field pea	1.34
Myallie Lupin	1.09
Gungurru Lupin	1.04

Discussion

Hail resulted in damage to Field Peas but not other pulse types.

Field peas have been a consistently good performer in these trials with yields of between 1.4t/ha and 1.8t/ha.

With better management, including rolling paddocks after sowing, field peas are a valuable crop and have been useful in crop rotations at Nyngan. Commercial paddocks have yielded similarly to these trials.

Albus lupins have also performed well on red soils. In trials they have yielded between 1.7 and 2.0t/ha in most years. Paddock performance has been similar, to a little lower.

Angustifolius lupins have been generally lower yielding but have also found a place in local crop rotations where they average around 1.2t/ha.

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