

Rankins Springs CWFS Alternate Farming Systems Trial

Rachael Whitworth, NSW Agriculture, Griffith
Michael Pfitzner, Chairman - Griffith

Key Points

- In 2004 the organic system had the lowest wheat yield and the highest screenings.
- The 2004 gross margin showed that the Albrecht, Soil Management Riverina and BioAg systems made a small profit.
- The Conventional, Soil Management Riverina and Organic systems have the best long-term (2000-2004) average gross margins, although they are all negative.

Background and aims of the trial

The Rankins Springs CWFS site was established in 2000 with a view to examine the long term environmental, biological and economical effects of alternate production systems. The idea of the trial came about as local growers have long been interested in the various alternative products on the market and wanted to get a better idea of what was available, the strengths and weaknesses of each system and what works best under local conditions.

The site is located opposite the gates of "Wattle Park", down Anderson's Lane, off the main Rankins Springs road. The soil type of the site is a red clay loam with a pH of 4.9, organic carbon 1.3%, CEC 12.32 meq/100g and a Ca:Mg ratio of 3.04. Paddock history of the site includes canola (1999); oats (1998); wheat (1997 & 1996). Average annual rainfall is 400mm, with an average growing season rainfall of 250mm.

Systems involved

There are seven alternate systems involved in the trial at Rankins Springs, with each system consisting of 3 x 0.3ha plots (a total of 1ha) in a random block

design. Plot size has been designed to suit sowing and harvesting gear.

Each system varies in the type and amount of inputs they provide including fertiliser, soil ameliorants, seeding rates, seed dressings and herbicides to name a few. Participating systems include:

1) *Conventional*: This system is based on local fanning practices in the Rankins Springs area. It is based on decisions fanners in the district would normally make when growing their own crops. This includes decisions on fertilisers, chemicals, tillage practices and overall crop management, with an overlying emphasis on the economics of each operation.

2) *Albrecht*: This system focus on achieving a balance of nutrients in the soil. The system is based on laboratory analyses. From the basis of detailed soil analysis, and plant tissue analysis when necessary, a specific fertiliser recommendation is made for the soil sample.

3) *Soil Management Riverina*: This system also focuses on achieving a balance of nutrients in the soil. It is a private company established in 1998 owned by a group of local farmers and

was developed in response to a need for independent agronomic advice.

4) *Alroc Mineral Fertilisers*: This system is based on mineral fertilisers. ALROC mineral fertiliser is an organic slow release fertiliser made from a blend of crushed volcanic rocks (basalt, granite, dolomite, bentonite and rock phosphate).

5) *Nutri-Tech*: This system aims to balance the nutrients in the soil as well as enhance the soil microbes. It uses an in-depth fertility analysis service called Nutri-Tech Soil Therapy.

6) *BioAg*: This system aims to balance and optimise the chemical, biological and physical properties of the soil. It is a biological farming system using methods and inputs designed to enhance the biological activity of the soils.

7) *Organic*: This system is being managed by a local organic grower along the lines of a certified organic crop. The first few years it was managed as a paddock or farm in conversion to certified organic production, with vetch used to build up soil fertility levels. 2003 marked the beginning of all systems being aligned in terms of crop rotation.

2004 Results

2004 was again a very tough year for the Rankins Springs area. Yields of winter crops were generally well below average as a result of the dry growing conditions. Most growers sowed on the rain at the end of May. The rainfall for the site is shown in Table 1.

Table 1: Rainfall for 2004

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
11	11	0	11	25	11	22	32.5	14.5	9	24	16

Total Rainfall 187mm

GSR 125mm

In 2004 all systems of the Rankins Springs trial were sown to wheat in mid June. Crop details for 2004 were as follows.

- ♦ Sowing date of trial: 17th June, 2005
- ♦ Seed rate: 40 kg/ha.
- ♦ Crop and variety: Drysdale wheat

The difference in inputs of the different systems remains a big eye opener for most of the local growers, and the operations inputs for each of the systems in 2004 are shown below.

/ . Conventional

1st Aug 2003	Spray Rup Pmax LVE	@ 1 L/ha + 0.5 L/ha
8th Sept 2003	STX 450+820 cultivator	
23rd Dec 2003	STX 440+820 cultivator	
15th Apr 2004	Cultivate	
17th June 2004	Spray Pmax	@ 1 L/ha
	Sow Drysdale	@ 40 kg/ha + pickle + 60 kg/ha DAP
17th Aug 2004	Spray Agtryne	@ 0.6 L/ha
3rd Dec 2004	Harvest & Cartage	

2. Albrecht

1st Aug 2003	Spray Rup Pmax LVE @ 1 L/ha + 0.5 L/ha
8th Sept 2003	STX 450+820 cultivator
23rd Dec 2003	STX 440+820 cultivator
15th Apr 2004	Cultivate
17th June 2004	Spray Pmax @ 1L/ha
	Sow Drysdale @ 40 kg/ha + pickle + 60 kg/ha DAP
17th Aug 2004	Spray Agtryne @ 0.6 L/ha
3rd Dec 2004	Harvest & Cartage

3. Soil Management

1st Aug 2003	Spray Rup Pmax LVE @ 1 L/ha + 0.5 L/ha
8th Sept 2003	STX 450+820 cultivator
23rd Dec 2003	STX 440+820 cultivator
15th Apr 2004	Cultivate
17th June 2004	Spray Pmax @ 1 L/ha
	Sow Drysdale @ 40 kg/ha + 90 kg/ha MAP
17th Aug 2004	Spray Agtryne @ 0.6 L/ha
3rd Dec 2004	Harvest & Cartage

4. Alroc

1st Aug 2003	Spray Rup Pmax LVE @ 1 L/ha + 0.5 L/ha
8th Sept 2003	STX 450+820 cultivator
23rd Dec 2003	STX 440+820 cultivator
15th Apr 2004	Cultivate
17th June 2004	Sow Drysdale @ 40 kg/ha + 120kg/ha MAP
17th Aug 2004	Spray Agtryne @ 0.6 L/ha
3rd Dec 2004	Harvest & Cartage

5. Nutri-tech

1st Aug 2003	Spray Rup Pmax LVE @ 1 L/ha + 0.5 L/ha
8th Sept 2003	STX 450+820 cultivator
23rd Dec 2003	STX 440+820 cultivator
15th Apr 2004	Cultivate
17th June 2004	Spray Pmax @ 1 L/ha
	Sow Drysdale @ 40 kg/ha + 2 L/t Nutrilife BioP + 5 L/t Seed Start; + 60 kg/ha Guano granules + 20 kg/ha Prilled C nitrate + 2 kg/ha K humate granules + 4 kg/ha stabilised B granules + 5 kg/ha Zn sulphate
17th Aug 2004	Spray Agtryne @ 0.6 L/ha;
3rd Dec 2004	Harvest & Cartage

6. Bio-Ag

1st Aug 2003	Spray Rup Pmax LVE	@ 1 L/ha + 0.5 L/ha
8th Sept 2003	STX 450+820 cultivator	
23rd Dec 2003	STX 440+820 cultivator	
15th Apr 2004	Cultivate	
17th June 2004	Spray Pmax	@ 1 L/ha
	Sow Drysdale	@ 40 kg/ha + 50 kg/ha DAP
	3.5 kg/ha soil & seed + 175 mg/ha vitamin B5 + 3 kg/ha microlime	
17th Aug 2004	Spray Agtryne	@ 0.6 L/ha
3rd Dec 2004	Harvest & Cartage	

7. Organic

8th Sept 2003	STX 450+820 cultivator
23rd Dec 2003	STX 440+820 cultivator
15th Apr 2004	Cultivate
17th June 2004	Sow Drysdale @ 80 kg/ha
3rd Dec 2004	Harvest & Cartage

Results - Yield & Grain Quality 2004

The highest yielding systems were Soil Management, Bio-Ag, Albrecht and Conventional (Table 2). All systems were significantly higher yielding than the Organic system which yielded 0.15 t/ha.

Protein (Table 3) was generally high last season with **all** protein above 15%. The Albrecht, Conventional, Organic and Soil Management Riverina systems had the

highest grain proteins. Alroc and Nutri-Tech had the lowest. The Organic system had the highest screenings (10.87%).

Given the season there were not a lot of gross margins which were positive in 2004 (Table 4). Although the organic system has low inputs its lower yield in 2004 still resulted in a negative gross margin. Albrecht, Soil Management Riverina, and Bio-Ag all recorded a positive gross margin for 2004.

Table 2: Average yield of the alternative farming systems trial in 2004.

SYSTEM	Ave Yield (t/ha)
Conventional	0.78 <i>bc</i>
Albrecht	0.96 <i>c</i>
Soil Management	1.00 <i>c</i>
Alroc	0.66 <i>b</i>
Nutri-Tech	0.70 <i>b</i>
Bio-Ag	1.00 <i>c</i>
Organic	0.15 <i>a</i>
<i>lsd 5%</i>	0.2522

Table 3: Average grain quality in 2004

TREATMENT	PROTEIN	SCREENINGS	TEST WEIGHT
Albrecht	16.1 <i>c</i>	8.4 <i>bc</i>	79.33
Alroc	14.97 <i>a</i>	6.3 <i>a</i>	80.33
BioAg	15.9 <i>be</i>	5.77 <i>a</i>	79.17
Conventional	16.27 <i>c</i>	6.9 <i>ab</i>	79.67
Nutri-tech	15.47 <i>ab</i>	5.4 <i>a</i>	79.67
Organic	16.33 <i>c</i>	10.87 <i>d</i>	78.83
Soil Management	16.2 <i>c</i>	8.93 <i>cd</i>	78.67
Significant	Yes	Yes	No
Isd	0.514	0.514	

Table 4: Average gross margins for 2004

	Total Income (\$)	Variable Cost (\$)	Gross Margin (\$/ha)
Conventional	126.67	141.68	-15.01
Albrecht	153.02	143.48	9.54
Soil Management	158.40	157.38	1.02
Alroc	107.98	167.48	-59.51
Nutri-Tech	114.80	183.88	-69.08
Bio-Ag	164.00	157.92	6.08
Organic	23.19	91.62	-68.43

Results summary 2000 to 2004

Since the trial commenced in 2000 we have had 5 relatively tough seasons with mostly below average rainfall. This has made the interpretation of the results difficult. Being a long term trial and having a lot of work go into adjusting the soil conditions of various systems, we are hoping the next few years will show more trends in our results.

The dry seasons and low yields have had a negative effect on the gross margins, particularly those systems that have large inputs, with long-term benefit. For example a lime application may last 15 years but the cost of application is included in the gross margin of the year of application. It may take some years for the benefits of these applications to be seen.

Table 5: 5 year (2000-2004) average gross margin (\$/ha)

SYSTEM	Total Gross Income (\$)	Total Variable Costs (\$)	Total Gross Margin (\$/ha)	Average Gross Margin
Conventional	488.09	591.78	-103.68	-25.92
Albrecht	472.45	962.46	-490.00	-122.50
Soil Management	429.43	570.44	-141.01	-35.25
Alroc	402.03	813.70	-411.66	-102.92
Nutri-tech	471.31	995.73	-524.43	-131.11
Bio-Ag	528.16	807.67	-279.52	-69.88
Organic	254.24	429.13	-174.89	-43.72

After 5 years, the conventional system is slightly ahead of the other systems (Table 5), although there is little difference between the conventional system, the Soil Management Riverina and Organic systems in terms of gross margin. The organic system has had low input costs, with the variable costs over the past 5 years the lowest.

Summary

The Rankins Springs group is looking forward to the next 5 years of the trial as the grounds have now been set for differences to show up based on the condition of the soil.

In 2005 the group proposes to prepare the site in anticipation of sowing a crop of barley, if there is not enough planting rain to sow the barley then the site may be fallowed in 2005.

Acknowledgements

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Local site Sponsors: Bayer Crop Science, Dow AgroSciences, BASF, Nufarm, Yenda Fruit & Case Supplies, F & R McNabb Pty Ltd, Incitec Pivot, Hi-Fert, National Australia Bank, PIBA, SGB, Auswest Seeds, Hart Bros Seeds, Pacific Seeds, Pioneer Seeds, One Steel, Yenda Producers, Elders VP, Rawlinson & Brown, Landmark and NSW Agriculture.

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