TO MEMBERS

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Western Australian No Tillage Farmers Association (Inc) WANTFA

MARCH 1994 *"NO TILLAGE—LEARN THIS CONSERVATION CROPPING SYSTEM"* NEWSLETTER VOL 2 NO 1

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INDEX

Topical Section

EDITORIAL *Bill Crabtree, Adviser (Esperance)*

Yet again many No-Till crops have excelled on the south coast. Both farmer paddock trials and intensive Department of Agriculture trials in 1993 have shown that No-Till has a good future in Western Australia. This Newsletter has several articles showing these results. All of the No-Till trials conducted in Esperance are included. It appears that there is considerable interest in the Newsletter which will continue to evolve as deemed necessary. I intend to make the newsletter now less frequent, perhaps 4/year. I am always hungry for stories and I encourage debate within the newsletter which can be done as either letters to the editor or as stories.

Since I am based on the south coast, it is possible that many articles may be solicited from the south. To rectify this tendency I would encourage northern No-Tillers or direct drillers to contribute. You may think that other farmers from different districts are more advanced with No-Till than you and that you have nothing further to contribute. However, as every district has it's own set of unique problems, your neighbouring farmers will find your story more relevant than someone else's who is 400 km away. Thank you to all those who willingly contribute. Farmers please don't be bashful if your english ability is rough as together and via the magic fax it's easy to make your thoughts clearer. Also it has been suggested that the authors phone and facs numbers be included along with their written article, so this will be done.

If, when you contribute, you would prefer otherwise, then please just let me know.

CONFERENCE & AGM AT DARKAN 10-11 MARCH *Kevin Bligh, WANTFA Secretary*

Both will be held at the Darkan Sports Complex. Billeting for accomodation is available for the night of 10 March and is to be requested through Ray Harrington on 097 363030 (phone/facs). Hotel/Motel accomodation is available at Darkan, Collie, Wagin or other towns. The program for the conference includes the following:

Thursday 10th March

9.30 am	Morning Tea will be available
10.00 am	Welcome Ray Harrington (President)
10.10 am	Alternative Legumes Dr K Siddique (Dept. of Agric, South Perth)
10.40 am	Questions
11.00 am	Weed Control David Hudson (Monsanto Aust. Ltd)
11.20 am	Questions
11.40 am	Research and Farmers Yields in 1993 Andrew Heinrich (Dept. of Agric, Esperance)
12.00 pm	Lunch
1.00 pm	Concurrent Sessions No-Till Hints for First Timers David Harrington (Chair - Darkan) Refining No-Till Systems and Techniques Graeme Malcolm (Chair - Morawa)
3.00 pm	Afternoon Tea
3.30 pm	Your Input on No-Till Needs Ray Harrington (Chair - WANTFA)
5.00 pm	Refreshments
6.00 pm	BBQ

Friday 11th March

7.30 am	Annual General Meeting

Business includes:

1. Receive the committee's report, treasurer's report and financial budget,
2. Elect committee-members to replace, or re-elect those whose term will have run out, being Ray Harrington (Darkan), Ken de Grussa (Esperance) and Lindsay Chappel (Perenjori) and
3. Consider constitutional changes;
   (i) that the President and Vice President shall be elected annually from amoung in-coming committee members, deleting the words "by the out-going and in-coming committee members" and inserting in their place "by the Annual General Meeting"
   (ii) to insert a non-profit clause to qualify us for the income-tax exempt status from the Australian Taxation Office, such as; "The assets and income of the association shall be applied solely in futherance of the above mentioned objectives, and no portion shall be distributed directly or indirectly to the members of the organisation except as bona fide compensation for services rendered or expenses incurred on behalf of the organisation."

No-Till Opener Expo At Wagin Woolarama, 11-12 March:

WANTFA has invited major manufacturers to display and discuss No-Till seeder openers at its stand at the Wagin Woolarama, immediately following the AGM (Wagin is about 60 km east of Darkan).

Kalannie No-Till Meeting, 3-4 August:

The Kalannie-Goodlands Conservation District have kindly undertaken to host WANTFA's Winter meeting which will include heaps of tillage and alternative legume trials. This will be a good show - do try and make it!

PROPOSED NORTH AMERICAN TOUR *Kevin Bligh, WANTFA Secretary*

Was the crop good enough to warrant looking into No-Till in the US or Canada in late 1994? The Taxation Department have advised that the estimated $5,000 cost "would be an allowable tax-deduction if the subject of self-education, being in this case No-Till, is directly relevant to the activities by which assessable income is currently derived".

The proposed WANTFA study tour is planned for the last 2-3 weeks of September and the first week of October. After a brief look at No-Till seeders used in the corn/soyabean (like our wheat lupin rotations), the tour would go onto Kansas and North and South Dakota in the US, and Manitoba and Saskatchewan in Canada. Stayers could also visit No-Till farmers in California where seeding would be commencing - a climate more similar to ours.

While in some respects our No-Till systems are probably ahead of theirs, others may not be, and some of their seeder developments may also be worth seeing, particularly in Canada. So far a dozen farmers and some wives have expressed a possible interest in the trip. If you are interested or want more information then please give me a ring on 09 368 3893 or 332 7003 (h) or facs 09 368 3355.

THE PLOUGHMAN'S FOLLY

Sean Fox-Slatter, Farmer
(Munglinup 090 751022 or fax 140)

It seems there is nothing new under the sun. Fifty years ago a Mr EH Faulkner wrote the above titled book to show some of the problems associated with ploughing. Our experience with wind erosion and the benefits of No-Till at Munglinup make us glad that there is a way of growing crops, other than ploughing, with confidence that they won't blow away.

Mr Faulkner's book is provocative and perhaps a bit radical and ahead of it's time with some concepts. The use of herbicides has given us an opportunity of controlling weeds without tillage, which was perhaps the main weakness with the implementation of his views. The two main issues he raises as the problems with conventional ploughing systems are; the destruction of desirable soil physical properties and the dependence on inorganic nitrogen rather than on the slow release organic nitrogen.

Faulkner states "We know that anything covered up in the soil is subject to rather prompt decay, if it is at all decayable, but we do not reason from that point to the position of regarding the products of decay as choice building material for crops growing in the immediate vicinity (page 12)." He also reasons that the price of inorganic nutrients became less expensive from 1915 to 1945 such that the keen adoption of mineral fertiliser use lead to a neglect in understanding and use of organic type fertilisers. He then says "The net result is that technical attention to the inorganic mineral supply has been more and more necessary; and the organic possibilities have simply vanished from consideration (page 14)."

The book is thought provoking. However some of his concepts of soil properties do not always confer with a classical soil-scientist like SG Brade-Birks who wrote the foreword to the book. The book contains some good reading and seems timely 50 years on, it was printed in Great Britain by Tonbridge Printers Ltd., 1945.

NO-TILLERS HAVE EDGE WITH CANOLA *Bill Crabtree, Adviser (Esperance)*

The recent excitement over Ross Whittal's 3.5 t/ha canola crop has made many think carefully of the ingredients that Ross used to grow his crop. Of particular interest here is Ross's No-Till and No-Erosion result on a lupin stubble on very light soil. There is some concern that many newer canola growers might try and get a fine seedbed (as that's what all the old literature says you should do) on a lupin stubble with full cut-out cultivation. Any cultivation on such soil could lead to erosion and farmers with No-

Till machines should be encouraged to put narrow points on their combines for this situation at least.

The high price of some canola seed makes precision No-Till seed placement very attractive as most seeds can be placed at the right depth into good soil moisture conditions. Press wheel use is also a big part of the reason for the improved establishment with No-Till. The Stones' article on their Cross-Slot (Agrisystems) in Sept '94 edition state that they have cut their canola seeding rate by 33% with their precise seed placement machine - a real saving! While Graham Laslett (OIC Dept of Agric, Jerramungup) has observed similar farmer trends with several farmers in his district.

Another benefit that Ross observed with his canola crop was the steady organic supply of nutrients to his No-Tilled canola. Ross noticed how the crop matured steadily with time, probably due to a slow supply of both nitrogen and sulphur throughout the year. Both nitrogen and sulphur are dynamic nutrients in organic material, both rapidly leach in acidic sandy soils. Consequently, a slow release organic pool of these nutrients is more likely to give a more steady supply than inorganically supplied ones - which may also be needed, especially nitrogen.

Science Section

STATE TILLAGE TRIALS

Andrew Heinrich, Tillage Research Officer (Esperance)
Ron Jarvis, Senior Tillage Research Officer (South Perth)

A number of tillage trials and demonstrations were conducted over the state during 1993. Variable and small grain yield responses to tillage were recorded in the Esperance area on the south coast while large positive response to increased tillage occurred on the western part of the south coast in the wet year. Tillage greatly increased yields on the yellow loamy sand at Wongan Hills. Below is a brief summary of our results.

Esperance Area (Cereals):

Grain yield depression as a result of using No-Till machines are not the norm on sandplain and shallow soils in the Esperance district. This was demonstrated at Esperance Downs Research Station (EDRS) and Alan Jones' (WANTFA's) machinery demonstration where no clear trend between seeding machines and grain yield appeared from the 1993 wheat results. Despite large visual differences throughout the growing season with some treatments, especially in the wheat after pasture at EDRS where only comparatively small differences in grain yield were recorded.

At EDRS the No-Till and reduced till plots appeared to be less vigorous during the growing season. Visually a marked increase in vigour could be seen as a result of increasing the depth of working of a wavy coulter in front of the Great Plains double disc or by increasing soil disturbance and the depth of soil disturbance in tined or deep ripped seeding systems. These responses were not reflected in the final grain yield. Below is the average grain yields (of the 2 nitrogen treatments, in t/ha), from EDRS where wheat was sown either after pasture or after lupins in mid-May with 140 kg/ha of Agras 1.

Machine and tillage treatment	After pasture	After lupins
Great Plains, no coulter	3.04	4.08
Great Plains with wavy Coulter working 7 cm deep	2.94	4.32
Great Plains with wavy Coulter working 10 cm deep	2.86	3.93
Great Plains, deep ripped immediately after sowing	2.69	3.93
Cross-Slot (Agrisystems)	3.50	3.61
Combine, Cut off lucerne *	2.88	3.69
Combine, Harrington point *	3.00	3.22
Combine, Super seeder *	3.11	3.35
Combine, Knife and weeder*	2.95	3.46
Modified combine, 2 inch point **	3.27	3.55
Modified combine, 2 inch point + press wheel **	3.13	3.81
Modified combine, 6 inch point **	2.84	3.75
Modified combine, 2 inch point and deep ripped immediately after sowing**	3.09	3.31
~LSD (5%)	0.33	0.33

*Seeding tines only used.

** point size refers to the size of the cultivating points working at 10 cm on the front 2 rows of the modified combine, wheat was sown on the back 2 rows of tines using cut off lucerne points in line with the front cultivating tines.

~The Least Significant Difference (LSD) is the smallest difference between the yields of two treatments that is statistically significant. If the difference between the yields is less than the LSD the two treatments should be considered as the same.

The highest yielding treatment in the wheat-after-pasture trial was the Cross-Slot at 3.50 t/ha, whilst the lowest was the modified combine with 150 mm (6") points working at 10 cm, 2.84 t/ha. The addition of 40 kg N/ha gave a 481 kg/ha increase in yield with no interaction with seeding machine (ie the response to N was similar for all seeding machines) therefore an average of both N treatments are presented above. Grain protein is currently being assessed.

The wheat-after-lupins trial gave similar results with no clear trend as to the effect of seeding machine or to degree or depth of disturbance. The Great Plains with a wavy coulter working at 7 cm achieved the highest yield of 4.32 t/ha in this trial while the combine with Harrington points

(which were not manufactured correctly) produced the lowest yield of 3.22 t/ha. The addition of 40 kg N/ha reduced yields by an average of 390 kg/ha with no interaction between seeding machine and N treatments. The level of rhizoctonia bare patch recorded in the wheat-after-lupins trial in 1993 was insufficient to cause a significant reduction in grain yield. Furthermore, there was insufficient rhizoctonia present to allow firm conclusions to be drawn as to the effects of various seeding machines on rhizoctonia control. Although a trend of increasing tillage intensity with decreasing rhizoctonia occurred. There was no relationship between grain yield and the level of rhizoctonia.

Deep ripping immediately after sowing produced small decreases in yields in all four of the 1993 tillage trials at EDRS, despite visual increases in growth during the season. This is in contrast to the results of previous years where large positive responses to deep ripping were recorded. The Esperance area has produced variable results from deep ripping over the years. We will be summarising the deep ripping and tillage trials in the near future in an attempt to clarify the situation as far as the seasonal effects on the responses for the south coast.

WANTFA's demonstration at Alan Jones', Speddingup:

Seven seeding machines were compared sowing wheat into lupin stubble on a shallow duplex (8-15 cm of sand over clay). The trial was sown on May 27 with Millewa wheat at 70 kg/ha after 80 kg/ha of topdressed DAP. The site was harvested after a very hot and windy day later in November that caused a lot of grain to shed. Yield loss as a result of the wind damage ranged from 0.6 - 1.0 t/ha across the 7 machines. Analysis of the grain yields of the harvester showed significant differences between machines (see below). When the grain from the ground was taken into account, there were no differences in total grain yield between the machines in grain yield. The lowest yield of all treatments was the 'conventional' plots sown with a Shearer 4-150 air seeder bar , 3.25 t/ha, while the highest was the Agroplant, 3.53 t/ha. All machines produced sound wheat that met the requirements for ASW wheat.

Machine	Agro-plant	Biomax	Conven-tional	Furrow Seeder	Great Plains	Janke	Woolford	Sign	Average
Header yield (t/ha)	2.60	2.48	2.24	2.65	2.71	2.75	2.62	***	2.58
Grain on the ground (t/ha)	0.93	0.89	1.01	0.62	0.73	0.61	0.73	*	0.79
Total grain yield (t/ha)	3.53	3.37	3.25	3.27	3.44	3.36	3.35	ns	3.37
Hectolitre weight (kg/hl)	80.2	79.5	80.4	80.1	80.7	79.9	79.8	ns	80.1
Screenings %	2.0	3.5	2.7	3.2	2.5	2.3	2.8	ns	2.70
Protein %	14.2	14.3	15.1	14.7	14.5	14.6	14.4	ns	14.52

EDRS Lupins:

The highest yielding of the 6 treatments in the lupin tillage trial at EDRS was the Modified combine sowing on 36 cm (14") row spacing with deep banded P, the lowest being the Great Plains and Cross-Slot. The yields ranged from 2.24 to 2.70 t/ha (see table below). Lupins generally do not respond to tillage except where an interaction with root diseases occurs. There was some variable rhizoctonia bare patch in this trial and it appeared more prevalent in the No-Till treatments.

Machine	Yield (t/ha)
Great Plains	2.24
Great Plains + wavy coulter at 10 cm	2.50
Cross-Slot	2.26
Combine No-Till (cut off lucerne pts)	2.52
Modified combine, deep banded P	2.66
Mod combine, wide rows & deep P	2.70
P =	0.05
LSD(5%)=	0.35

Western South Coast:

In a very wet year some of the trials and demonstrations were washed out completely while others were sown late. The Wellstead machinery demonstration was completely washed out and nothing was harvested from the site. Nearby at the Kojaneerup Research Annex some trials survived the wet conditions. Onslow barley on deep white sand (1 m to clay) had a 1.8 t/ha response to deep ripping. Direct drilled plots using 100 mm (4") points yielded 1.84 t/ha compared with 3.64 t/ha for the plots that were deep ripped 6 days after sowing. This result is in stark contrast to the 1993 Esperance results and may be due to sufficient stored soil moisture or rainfall at the critical grain filling time, enabling the better crop to reach its yield potential.

Mt Barker Research station also had a very wet year. The gravelly loam soils flooded at various stages throughout the year making it very hard to draw firm conclusions from the results of these trials. Although the yields showed large average differences between treatments, there was considerable variation within each treatment as a result of the wet conditions. The No-Tilled treatments, with either discs or points, performed poorly in comparison to the modified combine with 50 mm (2") points working at 10 cm. The modified combine yielded 2.9 t/ha of barley while the Great Plains yielded 1.7 t/ha. The Cross-Slot and the standard combine were mid range in performance.

Wongan Hills:

The reliable cereal response to deep ripping on yellow sandy loams and loamy sands has been well documented over the past 12 years. In a wheat after pasture trial in 1993 the deep ripped treatment outyielded the No-Till treatment (a combine with super seeder points) by 1.05 t/ha. The scarify and seed treatment also outyielded the No-Till by 0.52 t/ha. Direct drill with a modified combine using 50 mm (2") points only partly made up the yield difference between scarify and the No-Tilled treatments. Yield responses to tillage were similar for the wheat after lupins trial conducted last year.

The above tillage treatments at Wongan Hills were sown on the same day. In certain circumstances some machines may be able to establish a crop earlier in the season. This trade-off between machine and/or tillage sowing systems was addressed in a trial last year at Wongan Hills we will be conducting similar work this year on the south coast.

Results of the seeding systems trial for early May sowing were; 3.2, 4.1 and 5.1 t/ha for No-Till (combine with narrow points), direct drill with a modified combine and deep ripping. While a deep ripped mid-July sown treatment yielded 3.2 t/ha (the cost of deep ripping also needs to be factored into the trade-off equation). This illustrates the importance of selecting optimum sowing systems to maximise economic returns where yield penalties and advantages exist for different tillage systems.

Conclusions:

In this new era of direct drill/No-Till/deep ripping, our research is verifying previous results from the 70's and 80's in the northern regions (see chapter 7 of 'The Wheat Book', WADA Bulletin 4196). However, on the south coast the is considerable variability in responses to various forms of tillage, perhaps this is why many farmers on the south coast have embraced No-Till so keenly. The variability warrants explanation and is the reason for the current No-Till project on the south coast being conducted by myself (Andrew).

STUBBLE NEEDS MANAGING

Linda Leonard, Extension Officer (Merredin)

Bill Crabtree's article entitled "The Burning Question", in the last Newsletter, brought to mind some issues about stubble that warrant further clarification. Stubble is an important management tool that farmers can use to help in farm sustainability. For the system to work however, stubble usually needs managing.

There are several benefits to stubble retention. However, the main reasons in our current farming systems are to prevent erosion and reduce the severity of brown spot in lupins. The amount of stubble needed to prevent erosion and limit damage due to brown spot is estimated at 50% cover or 1.0 t/ha. The critical stubble level cover for wind erosion is 30% and for brown spot the best protection is often seen with up to 80% ground cover.

Low stubble levels provide little protection. Other strategies need to be adopted if cover falls below critical levels. High stubble levels do not necessarily mean more protection as in some cases stubble will be disadvantageous to both crops and pastures. In a pasture:wheat rotation high levels of stubble will reduce emergence of the pasture species.

Medic pastures are particularly intolerant of high levels of stubble (page 13 of "Managing for Stubble Retention", WADA Bulletin 4271).

There are several negative effects of excessive stubble levels. Less soil disturbance and dense stubble can lead to increased animal and insect populations like mice and snails. Stubble can provide the ideal environment enabling them to survive for longer.

Excessive stubble can also alter the germination patterns of weeds, reduce the seed soil contact of the crop (pinning), cause crop mortality problems in waterlogged situations, tie up

herbicides, increase cereal leaf disease carry-over and decrease soil temperatures which may decrease early crop vigour.

I am not suggesting that everyone should burn where high levels of stubble exist. Depending on what part of the state you are in, stubble may break down naturally depending on rainfall and soil type. If stubble does not break down easily, other options of removal may need to be looked at and stubble will need to be managed. We need always to focus on the reasons for retaining stubble and it is important to keep the right amount of stubble for what's required.

NO-TILL SURPRISES ALL

Ashley Stewart (Wittenoom Hills 090 767013 or fax 51)

Many farmers who toured the No-Till work at Esperance in 1993 would have viewed our tillage trial. You may have thought, like us, that the No-Tilled barley into pasture would yield much less than the barley grown on cultivated soil. However, this was not the case. We used our own header to harvest these strips, along with the 2 tonne weighing trailer from the Department of Agriculture, and found that increasing cultivation actually decreased grain yields.

This was our first year of No-Till. We purchased our Agroplant (scalloped double disks) mainly for the purpose of seeding lupins into thick cereal stubbles. However, we decided to try No-Tilling barley into a pasture paddock as an experiment and we were told to expect a yield reduction in this situation. We had the following four treatments which were sown at the same time, being: a wideline work-up then seed with tines 2 weeks later (min-till 1), a wideline work-up then sow with the Agroplant (min-till 2), a straight in direct drill with a full cut-out using tines and a No-Till with the Agroplant.

A small paddock was devoted to the trial with each treatment being long and narrow (500 by 55 m). The soil type was uniform and we took 3 harvest strips from each treatment. This allowed for some crude statistics to be done. Roundup was applied in late April, the conventional strip was worked up on 7th May and all treatments were sown on 21st May. Hoegrass and Tackle were applied in mid July. The growing season rainfall was 321 mm.

Increasing cultivation did decrease yields statistically. The yields (in t/ha) with increasing cultivation were 2.25, 2.10, 1.85 and 1.80 t/ha and protein was 10.1, 10.3, 9.8 and 8.7(%). The order of tillage was No-Till, direct drill, min-till (1) and min-till (2). The No-Tilled plot looked much thinner and less vigorous in growth than either of the min-tilled plots. It is interesting that the protein also decreased with increasing cultivation.

The paddock would have yielded over 4.0 t/ha had not the strong, hot wind occurred (see results of the WANTFA demonstration site at Jones'). However, the wind cannot be blamed totally for the better yields on the No-Till, when collected heads were added to the equation the No-Tilled plots still yielded 6% better than the min-tilled (4.78 versus 4.50 t/ha)

Farmers Section

JANKE TRIAL ON HEAVY AND GRAVELLY SOIL

Neil Wandel (Speddingup 090 753031 or fax 51)

Since purchasing a Janke machine in early 1993 I decided to test it in a range of tillage techniques. I farm in two areas: 450 and 380 mm rainfall country with farms on both medium to heavy soils. I used the Janke to sow over half of my 3,600 ha cropping program, which includes: wheat, faba beans, barley, peas, canola and lupins. My results with the Janke seeder were more than satisfactory.

My tillage trial was on wheat after a manipulated clover pasture (450 mm rainfall), which had been in a barley:pasture rotation for 4 years. The pasture was manipulated very early and successfully in 1992 with a 95% final clover content. SpraySeed was applied at 1.0 L/ha on 7 May then another spray of 750 and 200 ml/ha of SpraySeed and Dicamba was applied on 30 May. Janz wheat and DAP fertiliser were drilled at 75 and 60 kg/ha the next day. Many visitors to Esperance saw this trial.

We compared an Alfarm bar (7" spacing) with the Janke (10" spacing) either as a straight-in operation or after a cultivation. The pre-seeding cultivation was immediately before seeding. We also No-Tilled the Janke at either 10 or 20 inch spacings, just to see how much yield I'd loose at such a wide spacing. The Alfarm bar gave a full cut-out with the one pass, while the Janke moved only a bit of soil.

The trial was not replicated and there was a change in soil type across the trial area. Consequently, at harvest, we divided the trial into two sections, the north section which was of a variable sandy soil type (weaker soil on the eastern end), and the southern section which was of a uniform heavy soil type (see below). Remember there were no replications!

Tillage treatment	Grain Yield (t/ha)	Grain Protein	Screen -ings	Weight hL	Falling No.
Janke No-Till at 20"	2.78	12.2	2.0	79	427
Janke No-Till at 10"	3.32	12.0	2.0	78	433
Alfarm Direct Drill	3.18	11.8	3.5	76	402
Scarify then Janke*	3.09	12.5	3.7	76	411
Scarify then Alfarm*	3.24	12.2	2.5	76	421
Janke 20" - light soil	2.22	12.3	3.0	76	437
Janke 10" - light soil	2.60	12.3	2.0	77	420

* = worked immediately before sowing.

On the heavy more-uniform soil, there was probably no effect of tillage intensity on wheat grain yield. However, going to 20" rows over 10" spaced rows did reduce yields by 15% on both the heavy and light soil. This loss was less than anticipated. The hot Esperance wind on 25 November caused extensive grain loss in many crops. Although Janz stood up pretty well, it still lost some grain and less grain loss occurred with the wider rows. Measuring grain lost to the ground with 3 replications there were clear differences with row spacing; the 20", 10" and 7" lost about 100, 200 and 300 kg/ha.

We were very happy with both the No-Till trial and general paddock results from using the Janke. Some of the No-Tilled crops were slow at getting away but they mostly caught up with the more conventionally sown crops halfway through the season. We did have some teething problems with the scraper system on the discs but have now overcome that.

In dry seasons I can see some huge advantages in such a No-Till sowing system. In dry seasons No-Till could make the difference between getting our program in on time or not, since the soil doesn't dry out as it does with the cultivated soil. The Janke machine also provides excellent depth control enabling the seed to be placed exactly where required - on the moisture.

Rhizoctonia did occur on our farm though I'm not convinced that tillage is an effective way of controlling it on our soils. I realise that this differs from other trial work and I can't as yet offer an explanation as to why this is so. The use of a zinc spray at the 1-2 leaf stage appeared to be an effective means of reducing the impact of Rhizoctonia.

WIDE ROW SUCCESS WITH CEREALS

Miles Williamson (Cascade 090 792059 or fax 104)

Since the success of wide row spacings for lupins, we at ERP (Esperance Rural Properties) decided to test wide rows on an extended area of 400 hectares with machete wheat at Cascade Creek Station. This area has proven, in the past, to be difficult to safely establish a crop without wind erosion. The soil is a non-wetting sand, being 30-100 cm to clay which lacks good drainage.

Trial work by the Department of Agriculture in 1992 on the south coast (by Jarvis and separately Crabtree) showed that yield reductions were small with 14" row spacings over 7" spacings. For our trial we used a John Shearer air seeder with a 30' 4-150 bar, home grown knife points at 100 mm depth and 80 mm wide ARP wedge press wheels in gangs.

The machete wheat was sown at 80 kg/ha between 15-17 May after a lupin crop in 1992. Agras 1 was drilled at 123 kg/ha and 60 kg/ha of urea was applied on 27 June. Plant densities were 10-20/m2 more on the 6" row spacing where more stubble had to be removed to enable sowing. Raking was not required with the 12" spacing as trashing was quite adequate.

Some wind erosion occurred only where the stubble was removed despite the soil type where the wide rows were was more susceptible to erosion. Wind erosion did reduce plant density, and early crop vigour was poorer on the narrower rows. Better vigour (perhaps by 40%) on the wide row crop, even in the absence of wind erosion, might be due to more fertiliser being nearer the seedling.

We harvested each treatment side by side (strips) and weighed them into the Ag Departments weigh trailer (see grain yield in table). Our unreplicated experiment gave a small yield reduction of 2.4% with the wide rows.

However, this contrasted with the whole paddock result where the wide rows yielded about 10% more than the narrow rows despite being on a weaker soil type. The protein, screenings and hectolitre weights were from CBH for the two paddock sections. The wide rows were more economical due to increased grain quality even with the lower yield in the strips.

Row space	Yield (t/ha)	Protein	Scree-nings	Wt kg/hL	CBH grade and worth	Gross (ret/ha)
30 cm (12")	2.69	10.4	2.6	75.2	AH ($149)	$401
15 cm (6")	2.76	10.4	4.5	69.9	GP1A ($131)	$361

Interestingly, the sheep were better able to graze low to pick up most grain with the wider row spacing than with the narrow spacing, resulting in less eye damage. Therefore the sheep were able to graze the wide row paddocks more thoroughly. This result has made us further consider wide rows for cereals, the real advantages being knowing that the paddock won't blow, and we can seed with the same machine as for lupins. This years dollar bonus was above what we anticipated with the wider rows.

RHIZOCTONIA - NOT AS BAD AS FIRST THOUGHT *Matthew Jones (Ridley 090 767057 - p&f)*

Last year our farm was dubbed as having the worst rhizo ever seen by many visitors. However, in the long run it did not have as bad an economic impact as we first thought it might have. Initially it was disheartening to see such large rhizo patches (as big as a house) on parts of the farm. The patches were probably made worse by the use of sulfonyl urea herbicides, high pH soil, marginal zinc supply and our No-Tilling.

To put it in perspective though, the area affected by rhizo was not large compared to our whole cropping program. Perhaps 15% of our cropping program had rhizo in it with less than half of this being severely affected. All our rhizo patches were on the shallow sand over clay soils (pH 7.5-8.5). Where the sand is 20 cm deep or more we have not observed any rhizo. We tried reseeding a small badly affected area 6-8 weeks after seeding, however, both treatments were still badly affected by rhizo.

The areas that had rhizo yielded about 2.2 t/ha while the remainder of our crop yielded about 2.6 t/ha. The WANTFA trial on our farm (see Andrew Heinrich's article in this issue) showed a typical yield loss in the good crop areas of 0.8 t/ha. An irony of nature occurred in that the rhizo affected areas did not lose as much grain, in that hot Esperance wind, compared to the thicker and better grown areas. Harvesting these affected areas was quite tedious as the crop was very short in the patches requiring constant height adjustment of the comb.

This year we plan to apply zinc and manganese at a very early crop stage as Neil Wandel did last year with good results. We have not decided upon any machinery modifications yet. Also the Department of Agriculture will be conducting some trials on the worst affected area which we hope will come up with some more answers.

TRICKS LEARNT WITH NO-TILL

Ross Whittall (Gibson 090 782046 or fax 11)

We have been using the Biomax (now Forward) No-Till seeder for 3 years with very pleasing results. We would now consider it not practical to use any of the aggressive cultivation techniques that we previously used. Our yields have nicely increased since using a No-Till and stubble retention system (perhaps by 2.5 t/ha).

We are now noticing a much better biological 'soil structure' with increased earthworm activity as one indicator. We also now have a good protective stubble mulch and wind erosion is a thing of the past. Obviously, a good legume is the key driving force for our system. There are a few other things that we have done within the No-Till system that have also been helpful to us. These include; a double knock with knockdowns, tramlining and blowing air down the seeding boots to stop moisture-and-fertiliser induced blockages.

The double knockdown idea has been used for a while. For an early May sowing we typically use a low rate of glyphosate in April followed by SpraySeed between 7-30 days later and then seed 2 days later. With No-Till we found that just the one knock with glyphosate did not always do the job as weeds can regrow. The desiccant ensures weeds don't regrow in a No-Till system.

Tramlining for cereals may seem a bit radical to some but in practise is has worked well for us . In 1993 our boom was 5 times the width of our seeder. On every 5th lap we flick a switch, which turns the solenoids on, which shuts off the seed and fertiliser to outlets which are in line with our tractor wheel marks (same as spraying vehicle track width). Provided there are no human error on every 5th lap then we have a clearly defined path for vehicle passage over the paddock.

This tramline offers several benefits. It provides a firm pathway which remains weed free throughout the season (because of No-Till). We avoid wheel damaged crop which can generate new tillers that mature later. These later tillers can delay harvest or result in green grain in the sample. The tramline provides a visible pathway even for the following lupin crop. The blobs fall through the thick cereal stubble and are not visible when applying herbicides for a lupin crop whereas the tramlines do provide a clear path.

We commonly had fertiliser blockaging occurring in moist conditions. We fitted a cheap ($250) PTO driven fan which blows air into a manifold (old harvestair) mounted in front of the seeding box. Each seeding tube has a pipe at about a 30° angle which blows air down the tube and it also provides a gentle suction from the seed box. Now while warming our tractor in the morning we allow air to blow through the line which dries out the dew stopping our blocking problem.