6.3 An evaluation of Commercially available Foliar applied Stubble Breakdown Products

Location: Leigh Park, adjacent to the Inverleigh Research Site.

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Rainfall (mm) April – November : 233mmGSR

Summary of Findings: Within this trial, there was only a significant difference between two treatments for yield, within all 11 products applied. MV Breakdown was the highest yielding treatment at 2.995t/ha vs the 750ml/ha rate of Stubble Aid, which was the lowest yielding treatment at 2.623t/ha. All other treatments were not statistically different for yield.

All in-crop monitoring of stubble breakdown products showed that there was no significant difference within any of the treatments when compared to the control (Data being held at Melbourne University). A total of 1440 samples were collected and analysed in the laboratory for stress testing, of which no conclusions could be drawn.

Background to the trial: There is extensive evidence to indicate that incorporating crop residues into the soil has a significant impact on carbon levels. Thus, being able to identify ways in which stubble can be incorporated into the soil, especially in high rainfall areas where there is significant volumes of stubble remaining after the crop has been harvested, is extremely important.

Farmers have traditionally burnt stubbles, however this is now being seen as a method to use sparingly rather than all the time. There is considerable interest in investigating methods, be they mechanical or chemical, to assist with the breakdown of stubble and to incorporate stubble into the soil for maximum yield outcomes.

Trial Inputs:

Product List: 25/1/06 – Stubble Breakdown Products applied to a 4.5t/ha wheat stubble,

Incorporation: 2/2/06 – Scratch Till method of incorporation using Catros Amazone Disc

Seeding Date: 31/5/06, 90kg/ha Gairdner, 100kg MAP/ha, Chemical Regime: 31/5/06; Sprayseed @ 2L/ha + 1.2L/ha Triflur X, IBS 2/6/06; Dual Gold @250mls/ha + Diuron @500mls/ha, PSPE 21/7/06; Slugout @ 5kg/ha, GS15

12/9 /06; Tilt @ 500mls/ha, GS30

Nitrogen: 27/8/06; Urea @ 100kg/ha applied in broad spread manner; GS31. Harvest: 27/11/06; within each plot area, a 50m x 1.8m plot was harvested through each replication.

Trial Design:

A split plot block design was used for this trial covering an area of 2ha in total. Twelve treatments were used in the trial, with each treatment replicated four times for yield, or 48 plots within the total trial. Plot size was 8m x 50m. The treatment list was applied on January 25th 2006, followed closely by incorporation and 12mm of rainfall.

- 1. Easy ATS 130 L / Ha
- 2. Easy N 50 L / Ha*
- 3. Minerol 5 L / Ha*
- 4. Bio Ag 4 L + 25 L Easy N / Ha*
- 5. CSR 3 15 L / Ha*
- 6. Control
- 7. Stubble Aid ... 750 ml / Ha*
- 8. Stubble Aid .. 850 ml / Ha*
- 9. CCC 15 L / Ha*
- 10. MV Tea 100 L / Ha
- 11. MV Breackdown 100 L / Ha
- 12. Lawrie and Co 30 L NHM + 12 L Fungi Brew / Ha*

*Where product quantity rates did not achieve 100 + L / ha, water was used as the additional carrier (upto 100 L / Ha).

Approximately 6 weeks after the application of the treatment list, the first batch of stubble was gathered from 36 sites (3 of the 4 repetitions). After a further 10 weeks, a similar sampling program was undertaken, with the 36 plots sampled again in early June.

Twenty sub-samples were taken from each of the thirty six plots on each occasion. A total of 1440 samples were collected and tests were completed on all samples. The stubble selected was carefully labelled. Each sample was oven dried and then the stubble strength was tested.

Strength testing took place by determining the force required to break each stem. The circumference was measured using digital callipers and then the stem was placed across a 'bridge' and weights added until the straw broke. The force was then recorded.

Trial Results:

After all laboratory results had been compiled the results were averaged and the data analysed. The harvest results can been seen below in Table 1. Four replications were used.

			Test Weight
	Yield T/ha	Screenings %	kg/hl
Easy ATS	2.807	29.44	58.67
Easy N	2.768	24.44	60.31
Minerol	2.902	22.34	60.79
BioAg	2.822	31.15	59.56
CSR 3	2.643	30.32	59.03
Control	2.678	29.31	59.19
Stubble Aid 750ml	2.623	28.64	60.41
Stubble Aid 850ml	2.775	27.42	59.39
CCC	2.700	27.11	57.78
MV Tea	2.827	28.84	59.05
MV Breakdown	2.995	26.40	59.16
LawrieCo NHM+F	2.940	30.79	59.17
LSD 5%	0.366	9.200	2.700
Sig Diff 5%	Yes	NO	Yes

 Table 1. Statistic Analysis for Stubble Breakdown Data, Yield & Quality, Inverleigh

 Stoney 2006

Trial Observations: Due to the dry season, it is expected that any biological outcome will be limited in its response. There are also a number of reasons why there may have been no conclusive outcomes with regards to laboratory analysis:

- The natural variance in the straw strength;
- The test methodology may not have detected the level of decay of the straw;
- There may have been environmental factors which impacted on the breakdown of the straw.

In conclusion to this research it is not possible to support or reject the claims relating to the stubble decay products due to the testing method used and that the environmental conditions were not conducive to rapid breakdown of straw. However, it is of the view of the researchers that this project is worth further investigation over a longer period of time. This would allow for residual effect of the products to build up over time.

Photographs: Seeding through incorporated stubble treatments (left), Standing stubble vs incorporated treatments (right).

