



SOUTHERN
FARMING
SYSTEMS



Department of
Primary Industries



Grains
Research &
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Corporation

BED TIME STORIES

No. 3

A networking newsletter for Australian Bed Farmers

Sept 2003

The “Southern Seeder” Surfaces

Since the introduction of raised beds and controlled traffic cropping in 1996, there has been a tremendous interest generated in seeding techniques to successfully sow our new “uneven” ground. Many ideas and developments have taken place and the photo below shows the latest.

This machine has been purpose-built to handle making raised beds, renovating raised beds and sowing raised beds as well as flat soil. The full story of where we have come from to reach the design of the machine below.

continued page 6



The new machine being tried for the first time.

From left, Mark Watson, Peter Blair, Rex Watson and John Hamilton discuss it's performance.

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BED TIME STORIES

From the Editor – Bruce Wightman



Welcome to the third edition of Bed Time Stories. There was little feedback from the second edition but I did receive a letter from a person concerned about my comments on direct installation of beds and deep ripping. The writer felt I over-emphasised the 'good' points of direct bed installation and under-emphasised the problems encountered and I actually agree.

However, the large machine owned by Simon Gillet did work beautifully in the lighter, sandier soils but certainly struggled in the heavier, clay soils. It must be remembered however that Simon was trying to install about 2,000 hectares of beds with one pass in a very, very dry autumn. I think it would only be natural that every part of the operation was going to be difficult. As soon as it rained the soil become workable and there were very few problems.

Bill Day from Nagambie was only aiming to install 40 or 50 hectares of new beds and was prepared to go over the paddock three times to achieve a good result. By the way, Bill experienced a very dry year and he felt the canola root systems found it very difficult to break through the hard ground in the uncultivated new beds.

The correspondent also questioned my comments about deep ripping. At this stage of our knowledge and experience, I believe that at all times deep ripping should be kept away from the furrows in established beds and should be no deeper than the furrows in a new paddock yet to be bedded. Therefore I guess we should ask, what is deep ripping? To me, deep ripping is going down to the depths of 25cm and deeper. This is deeper than the initial cultivation a chisel plough might achieve in preparation for bedding. Therefore with my level of understanding and interpretation, deep ripping should not be practiced before bedding. However, after the beds are established, deep ripping (25-50cm) is being considered by many farmers and lots of research is going on to identify any benefits. I have always hoped that once we get rid of waterlogging, plants will establish deeper rooting systems and biological deep ripping would eventuate.

Renick Peries, our soil scientist will be studying the root systems under lucerne this season and we look forward to see if biological ripping is being achieved.

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Bob Evans - Victoria's Oilseed Guru Goes Golfing

It certainly was the passing of an era when my wife and I helped celebrate Bob Evans' cropping career at his retirement party in Ballarat recently.

Bob was growing crops at Vite Vite North in 1972 when I asked for some land to carry out my first canola (rapeseed) trials. He had no hesitation and that was the beginning of a long friendship.

From farming Bob joined Cargill Oilseeds about 21 years ago and his commercial agronomic career flourished and he certainly is regarded by all as the most knowledgeable and experienced oilseeds agronomist in Victoria.

Bob is a great listener, a keen observer and was more than ready to help wherever he could. So much so, that for many years he "grew" every crop for every farmer.

Well done Bob, a distinguished gentleman who had a distinguished career.

We all hope Bob and Isabell have a long and happy retirement.

Suck it and See!

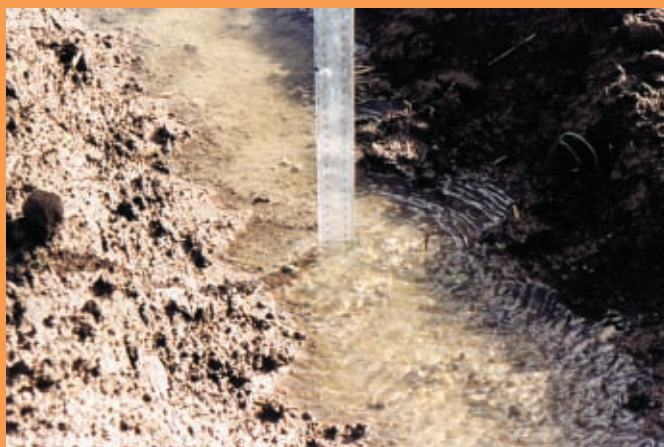
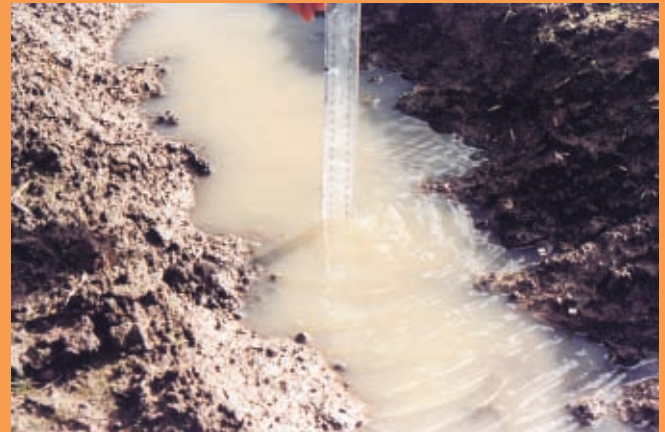


As all raised bed farmers know, some paddocks become easier to traffic when in beds while others can become harder. Soft furrows can cause problems and 'milky' run-off water is not a good sight.

To try and help solve both problems, I spread 1t/ha of gypsum the full length (700m) of a furrow. The 1t/ha rate of gypsum equates to 5t/ha within the furrow (400mm furrows in a 2m bedded paddock).

**Gypsum at 5t/ha
(in furrows only).**

**Run-off water from
the adjacent furrow
after the first rainfall
event - milky or
cloudy with dis-
persed clay.**



**Run-off from the
gypsum treated
furrow - crystal
clear. However,
this effect did
not last and the
second rainfall
event produced
cloudy water.**

I did not observe any significant difference in the softness of the furrows in the first year. I will keep you informed but I'm not holding my breath. I think we'll see furrow stability very much improved when we perfect the technique of furrow cleaning and the reduction in the number

Headland Management Project

founded by GRDC (Project SFS4)

In the last issue of *Bed Time Stories* I outlined the treatments we installed to try and help alleviate the wet soil problems in the headland and collection drains at the end of the raised beds. To refresh your memory we increased the height of the headland wide raised bed to about 650mm in the centre. We then introduced culvert drains and three collector drain treatments.

The collector drain treatments were:

- collector drain deepened and backfilled with large crushed rock.
- agricultural drainage pipe installed 400mm below collector drain and backfilled with 40mm clean gravel.
- control.

Road-grader reworking and reshaping the headland at the SFS concept farm at Winchelsea where the work is taking place.



As well as reshaping the headland, culvert drains have been placed under the headland at the lowest point in the paddock. The headland is now fully trafficable.

The following photos show how the treatments worked in an average rainfall situation for Winchelsea, which means quite wet!



At sowing, conditions were moist and the collector drain on the control treatment instantly showed the effects of the tractor and airseeder weight.



The large crushed rock treatment took the weight of the machine but the rocks squashed into the mud. The tractor driver reported difficulty negotiating the rough passage.



The underground treatment removed water very well and remained 'dry' and withstood the tractor weight very easily.



During the winter it became very apparent that the underground drainage treatment was far superior. This photo shows the control (foreground) compared to the underground treatment (background).

The underground treatment in late winter. Note the slightly wet areas between the gravel and the beds. A steeper 'apron' has been installed in our new project.



Headland Management Project

New Project 2003

This season we have installed a full 350 metre headland with the underground system. The headland has been reshaped and second hand 100mm slotted plastic pipe installed



◀ The backhoe digging the 450mm deep and 300mm wide trench. The spoil was removed while the backhoe was working and a gravel base added to the trench.



▶ The apron between the beds and the underground drain has been set at about 4%. Last season the apron was 1% and we felt it was not quite steep enough to carry water efficiently.

◀ This season we became mechanised. Here the farmers grain truck was used to add the gravel base.

Pipe was fed off a reel directly into the trench. We have not used a filter sock over the pipe. We will have to wait and see if this was a good idea. We have installed a small length of pipe with a filter sock to observe any difference.



Gravel (40-50mm) was placed over the pipe using the grain truck. However this time a much larger chute had to be constructed for the truck to handle the larger diameter angular gravel. Our photo shows Renick Peris admiring the finished job.



◀ Poorly drained collector drain after 50mm rain in 2001.

▶ The same collector drain soon after 50mm of rain in July 2003. No puddles or surface water to be seen.



Sowing Story To Date

It certainly has been an interesting 7 years since raised beds were first tried at the Southern Farming Systems site at Gnarwarre. Bed making techniques pre-occupied the thoughts in the first year or two but sowing techniques quickly gained the spotlight. Below is a pictorial history of “raised bed sowing”.

An old Napier was the first sowing machine converted to sow raised beds. David Cuthbert and Bruce Wilson spent many hours ‘cutting and pasting’ to make this machine suitable to sow beds - and it did work very well.

1 ▶



A “511” with a direct drill undercarriage. Note the extension to the undercarriage, long narrow knife points and the tube to distribute seed into the furrow in front of the wheel.

◀ 2



▲ 3

A “511” with an elevated box to allow the seed to flow smoothly to the furrows and outriggers. It quickly became apparent that harrows were not needed on beds and it was best to leave the tops ridged to harvest water - as long as the beds were a good height.



▲ 4

A well ridged bed after sowing. Knife points and press wheels created this “ideal” situation - but the bed must be high enough to internally drain water to the furrows.



▲ 5

A slightly less ridged bed top created by rolling after sowing with a heavy ridged roller built by Lynton Langley at Winchelsea. An added benefit was the creation of top soil conditions which end up fine and firm enough to inhibit the movement of slugs. No slug baiting was required on this canola crop.



▲ 6

From the first trial with raised beds we experienced difficulty establishing plants in the “rounded” shoulder of the bed. Rain sheds very quickly and moisture penetration is minimal.

6



▲ 7

The first press wheels used on beds were placed on the outside rows where establishment problems were being experienced. Also the tines were extended 50mm to gain a full soil cut.



Our first results with these “shoulder” press wheels was exceptional. Increased germination and establishment rates of around 50% compared to the centre rows of the bed. As well the plants emerged up to a week earlier. Soil conditions were marginal for moisture.

◀ 8

Sowing Story To Date



Seven full rows up on a rounded bed. In this example press wheels and extended tines were on the outside rows. This success led us to pursue the use of knife points, press wheels and correct sowing depths using adjustable tines or sowing depth control press wheels.

◀ 9



have independent depth control, preferably by a press wheel. The photo shows our first attempt to produce such an item. Based on a parallelgram attached to the spring release tine it soon fell short due to our rocky conditions which produced very harsh forces on the assembly and after a while the idea failed. A number of farmers purchased this concept from commercial machinery manufacturers and unfortunately some did not work well.

◀ 10

With many paddocks exhibiting uneven bed height, furrow depth, rounding of beds, sowing flat paddocks and raised beds many farmers began to 'want' a more versatile ground tool. There has been general agreement that each sowing tine / boot should



▲ 11

However some have worked extremely well but they have 'solved' the problem of the the severe forces. This machine has the parallelgram attached to the tool bar and the spring release tine is within the ground tool.



▲ 12

Another example of the ground tool attached to a parallelgram which in turn is directly attached to the tool bar. The system works very well.



▲ 13

Here is a system where the parallelgram is attached to the tine. HOWEVER, the tine has a HYDRAULIC BREAKAWAY and is extremely gentle in its action unlike a spring release system. This system also works very well and the concept has been purchased and produced by farmers with great success.



▲ 14

HOWEVER, the search has gone on for a simple and cheap sowing assembly. One local farmer produced a tool bar with about seven different ground tool configurations - EACH WAS ATTACHED TO THE TOOL BAR SEPARATELY FROM THE OPENING TINE AND KNIFE POINT. This is an important difference because if a rock is hit no forces from the opening tine are passed on to the sowing tube and press wheel.



◀ 15

From the seven different ground tools shown above, the farmer chose one design that worked well and included these into the design of his air seeder.

Another local farmer and machine manufacturer further developed the concept of press wheel depth control shown above.

▼ 16



So what is the ideal sowing machine for our purpose? I believe it should have the following features:

1. **Excellent clearance and sowing height to accommodate the tallest of beds.**
2. **Ability to sow controlled traffic flat country and beds without too many (if any) adjustments between areas.**

3. **Bed renovating ability.**

4. **Long knife points to help break up rhizoctonia and allow the primary roots quick and easy access to the subsoil.**

5. **Press wheel sowing depth control.**

6. **Folding for easy transport.**

7. **Light enough to sow through wet conditions.**

8. **Ability to sow more hectares than a normal combine between fills.**

9. **Handle soil conditions ranging from sand through to heavy clays.**

10. **Excellent trash clearance.**

11. **Press wheels that can handle sticky and cloddy soils.**

Sowing Story To Date

Three machinery manufacturers in Geelong met late last year to discuss the idea of producing the 'ideal' sowing machine for our conditions - one that would satisfy the above aims Rex Watson (speciality - raised beds machines), John Knuckey (speciality - press wheel assemblies) and Harry Green / Daryl Cooper (speciality - air seeder boxes) decided to pool their resources and produce a small

prototype machine. However, an Inverleigh farmer got wind of the idea and decided he would put his hand up and order a commercial size machine.

Another farmer from Berrybank made the same decision and two machines have been built.

These first machines really are prototypes but they have performed very well indeed. Of course there have been a number of teething

problems and many adjustments have been made...and many more will be made to future machines. However, the concept and design is certainly on the right track to satisfying all the above criteria for the 'ideal sowing machine'.

Naturally I can't endorse the machine, but to make up your own mind you are more than welcome to contact the manufacturers.

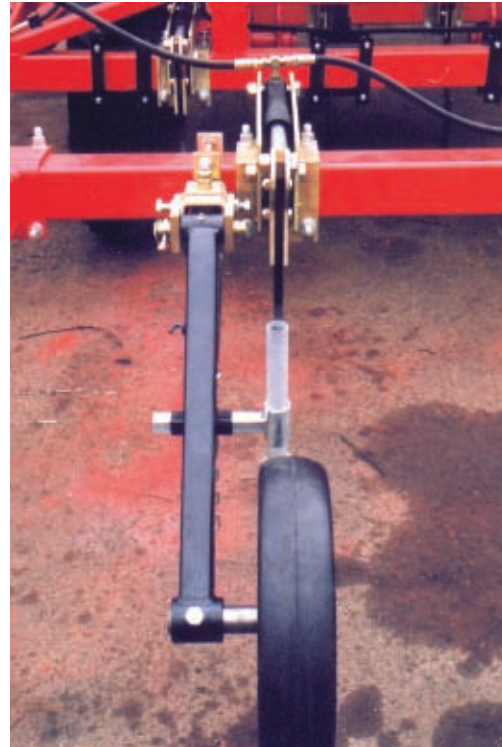


To accommodate bed renovation (and perhaps bed making) furrowers have been fitted to the front tool bar.

Knife points, press wheel depth control and spring sowing tubes have been incorporated. Also hydraulic rams are used for the opening tines and points.



Note the opening tines and press wheel assemblies are attached to the tool bar separately.



Full adjustment if the swivel sowing tubes and press wheels are incorporated. Press wheels cannot hit the tool bar behind.



Two air boxes with 880 litre capacity fitted over the tool bars. Small air boxes are fitted to reduce the temptation to carry too much weight in wet conditions.

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