



Department of
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SOUTHERN
FARMING
SYSTEMS

BED TIME STORIES

No. 2

A networking newsletter for Victorian Bed Farmers

Sept 2002

Beds without Cultivation

Two Victorian farmers with a mission to plough straight ahead. They may be poles apart in the area they crop, but Bill Day from Nagambie and Simon Gillet from Ballan have the same ideas. That is to install raised beds without full soil disturbance. Bill is going straight into pasture while Simon is going into stubble ground. How are they going? See pages 4 & 5 for the full story.



Bill Day busy making 2 beds at a time on a hot dusty day in April.



Simon Gillet with his huge bedformer making 5 beds at a time in March.



Bill admiring his handy work. The excellent beds & furrows on the left have had 3 passes while those on the right 2 passes.



Simon inspecting the bed height and furrow depth after a single pass of his machine.

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WATSON
FARM MACHINERY

31 Separation Street, North Geelong Vic 3215
ph 03 5277 2777 mob 0408 520 267 fax 03 5278 3084

www.watsonfarmmach.com.au email: watsonfarmmach@bigpond.com.au

ABN 99 007 196 223

BED TIME STORIES

From the Editor

Bruce Wightman



Welcome to the second edition of Bed Time Stories. I do hope you enjoyed the 1st edition and gained some useful information or ideas. I certainly received lots of good feedback from readers.

Over the past 3 or 4 months I have been travelling far and wide observing some very exciting activities. There is no doubt about it, enthusiasm and faith in the raised bed concept is exceptionally high and even I get somewhat startled but at the same time thrilled at the developments taking place. Deep ripping, bed maintenance, land planing, direct bed installation, headland development, buffer dams - the list goes on!

On a sobering note, there is one area we all must seriously consider. That is, where is our drainage water ending up? Neighbours must be given every consideration. Recently I was approached by a farmer who felt since a number of his neighbours had installed raised beds, water was coming his way a little faster on some occasions than previously. He also felt that a drain under the road on the lower side of his property was not really effective enough and water was backing up on his property. I inspected the property and spoke to his neighbours and the shire. All parties expressed a keen interest in helping. Hopefully, the outcome will be good. The farmer concerned is certainly not against raised beds and is contemplating installing beds in his own paddocks.

I have now had a number of these types of negotiations and good communication between parties has worked wonders. Please talk to your neighbours about your program before they stop talking to you personally and use a solicitor instead!

Graeme Anderson, our Farm Forestry specialist has just come back from a holiday to Western Australia with some interesting news. He tells me that some farmers as part of an NHT project are being subsidised at \$75 per hectare to install raised beds. Such is the waterlogging and particularly salinity problems in Western Australia that they have decided to encourage raised beds to see if it can be another means to alleviate both limits to productivity.

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Editor:

Contacts:

Postal Address:

Bruce Wightman, NRE Geelong

Southern Farming Systems, Ph: 03 5229 0566

Bruce Wightman at NRE, Mobile 0419 586 891

PO Box 916, Geelong Vic 3220

Paddock Preparation - What's the Latest?

District Activities



1. A number of paddocks in SW Victoria have been fully cleared of the rock piles which were pushed up many years ago. Also excavators like the one pictured have also been very busy removing the surface floaters so deep cultivation can progress.



2. This Yeomans plough is fitted with tines and points which appear to be about 450mm long. Many paddocks have been deep ripped before bedding this year.



3. The ripper is set at about 300mm depth. The machine is seen here working light sandy clay loam at Teesdale.



4 & 5. A second contract ripping service I caught up with was using a Gessner machine pulled by a Cat tractor. As you can see plenty of horsepower is involved in both these operations.



6. The first large land plane I have seen in the district to level country before bedding is owned by David Langely of Winchelsea. David purchased the machine from the irrigation districts of NSW. The length of the machine is 25m.



7 & 8. David has adapted the machine to cut and fill effectively behind his relatively small 150 HP tractor and to handle the odd rock he hits in the paddock. Although not set up to give a billiard table finish, the result is a vast improvement over the natural unevenness.



As I said in the Editorial, land development for raised beds is occurring very quickly and with an aggressive flair. It reminds me of the activities we observed on a trip to the Murrumbidgee irrigation district a few years ago.

Very little deep cultivation occurred in the early days of raised beds in our area. Large areas of beds were installed very quickly. After a couple of wet periods over the past 2 years a number of farmers have decided to increase the height of their beds. Some others are trying ripping to increase the depth of friable soil below the bed.

I'm sure many of you remember the extensive deep ripping that occurred in the 1980's with some very poor results, instead of ending up with 75mm of mud, farmers ended up with 75 cm of mud. My advice is not to rip deeper than the expected furrow depth when setting up a paddock. If ripping into existing beds keep the rip marks in the bed area and away from the furrows. Whether or not ripping below beds is beneficial is still unproven. However Southern Farming Systems has a number of trials looking at the practice.

One of the biggest problems with the effectiveness of raised beds is paddock undulations and natural depressions where water can pond in the furrows. The crop plants may be able to survive the high tide but trafficking the paddock can become difficult. Even if it is possible to traverse, the tractor wheels may sink and uneven furrow depth results.

One of the first farmers to try to overcome this problem was Bill Day from Nagambie who developed a raised bed machine from a land plane (pictured pg. 4). A furrower positioned in the centre of the machine cut and filled very well and produced a very even furrow. Others are land planing before bedding in an attempt to even the soil surface.

Beds Without Cultivation



The Southern Farming Systems installed raised beds directly into stubble without cultivation back in 1998. Good beds were formed but it required two passes with a Rex Watson/Gessner type bedformer. There are certainly short-term advantages in direct installation of beds. The beds and furrows are very firm - a distinct advantage if the season turns wet suddenly. Also all that improved soil structure from the pasture phase is not destroyed by the thorough cultivation we normally give a paddock before bedding. Some would argue that some paddocks

1. Bill Day was one of the pioneer bed farmers in Victoria and direct installation is not new to him. Our photo shows David Langley (Winchelsea), Bob Evans (Cargill Oilseeds) and Bruce Wilson (Winchelsea) inspecting Bill's old landplane fitted with a furrower (centre) and grader blades. Bill has never cultivated a paddock before bedding and he used this machine to install 3m wide beds before he changed to 1.7m beds.



2. Bill's current bedding machine is a trailing design fitted with depth wheels that are positioned to run on top of the bed.

3. Bill standing beside beds that were formed directly into pasture with one pass. The machine was fitted with a single ripper in front of the furrower. The soil was moist at the end of last spring.



5. The third pass is back to a single ripper and this photo shows Bill's experimental grader boards. I think rocks would be a problem in volcanic soils. Note the spiked roller pulled behind to break large clods.



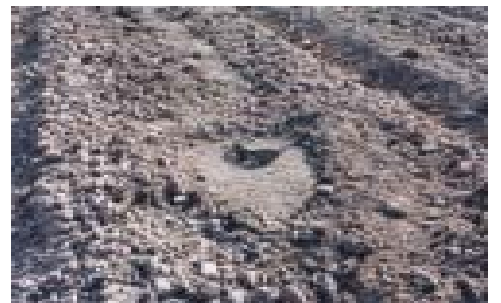
4. The second pass is made in the autumn with the machine fitted with two rippers. These help widen and deepen the furrows.



6. The machine in action on the third pass. Some dry soil was falling back into the furrows under the grading chains.

7. Excellent beds after 3 passes. 15-20cm high even in extremely dry conditions.

8. Firm soil in the bed under a 3cm layer of loose soil - enough to germinate crop seeds.



Beds Without Cultivation

need a good deep cultivation and they are right. I believe deep cultivation is the most expensive part of the whole bed forming operation. If Bill and Simon's attempts are perfected, I'm sure there will be large savings to be made in both time and money. However, both farmers agree it is not all beer and skittles and lots of homework is required.



1. Big equipment is needed for a large area. Simon Gillet makes 5 beds at a time - one x 3m bed behind the tractor and two x 2m beds on the outside. The 3m bed will fit his large tractor and header better for controlled traffic purposes. Like Bill Day's machine Simon's is of a trailing design.



2. Depth wheels and travelling wheels in one. Apparently the machine when folded up travels very well which is important for Simon who crops in various districts. The machine as pictured did rock and roll somewhat while making beds.



3. This photo shows one of the few modifications Simon has made. Notice the addition of an extra set of stabiliser wheels to the outsides.



4. Penetration has been a problem in the heavy clay soils which is totally understandable during the dry conditions of April. Larger rams have been fitted to the furrow tines to increase breakout pressure. Also Simon has fitted rippers in front of the furrowers to help cut furrows while conditions remained dry.

5. During the dry autumn excellent beds could be made in the lighter soils. The furrows were formed with one pass. As you can see, they are about 18cm deep.



6. The beds came up very even and a good height in the lighter soils.

Bed Maintenance

Farmer Activity

Many farmers are in the era of bed maintenance. There are lots of innovative machines and methods being employed and this page shows the efforts of a local farmer as well as a bed maintenance trial at Southern Farming Systems, Gnarwarre, which is financed by the GRDC. The results of the SFS trial will be featured next year.



1. A recently constructed bed maintenance machine showing 3 deep cultivation tines and furrowers.

2. The back of the machine employs a shaper and soil compactor.



3. The starting point for the above machine. Burnt stubble on rounded beds about 12.5cm high. Soil type is a sandy loam.

4. (Right) The machine flattens and compacts the beds. It squares off the shoulders and raises the bed to about 20cm.



Southern Farming System's Activities



1. Two year old beds on a self-mulching clay loam at SFS, Gnarwarre. Bed height about 7.5cm.

3. Beds reshaped with a standard bedding machine. Bed height increased to 17.5cm.



2. Beds fully cultivated to 10cm and re-shaped with a standard bedding machine. Height increased to 15cm

4. Beds deep ripped (2 rips per bed) to 50cm and reshaped. Bed height increased to 17.5-20cm.



Raised Bed Forming/Maintenance

You may remember in the last issue I featured this year's challenge. It was to run a bedding program with a large 8-wheeled tractor and air seeder with the aim of not purchasing any new equipment except an attachment to the air seeder to allow for bed making and bed maintenance. Rex Watson in Geelong has built the bedding attachment and it is ready to go.



1. It wasn't easy but the job's done! An extra furrower will be attached to the centre of the A frame. Therefore 6 beds can be constructed and maintained using 2 x 2m beds in the centre and 2 x 1.6m beds on the outsides. The air seeder wheels will follow the furrows. An extra wheel is being attached to the centre/back of the air seeder to give extra floatation.

2. Making 10.4m of beds at once needs long, well constructed marker arms.



With so many ideas floating around about raised bed machines and methods to handle raised beds, I quite often get asked if I have a best practice. I'm not sure I really do because agriculture is not black and white and there are so many variables. However, the method employed by Neale Seach at Euroa is high on my list of favourites. Neale set out his paddocks very well to begin with and then cultivated thoroughly. He then employed a contractor to bed the paddocks.

With the help of Rex Watson they have built a bedding machine on the front of a Chamberlain 746 seeder. The following photos tell the story.

1. Well set out paddocks and about 10 buffer dams are a feature of Neale's raised bed enterprise.



2. Hydraulic tines, spring loaded grader boards and long narrow sowing points are the basis of the bedding/seeding machine.

3. The bedding set up clearly shows how it works.



4. The machine in action pre-drilling urea in April.



6. The smooth furrow behind the furrower. However, there was a lot of soil falling back into the furrows in this operation. It was very dry and soil was flowing everywhere due to the deep placement of urea and harrows used to seal the urea below the ground. This will be cleared out at sowing.



5. Another 'action' shot. Note the evenness of the furrows in front of the tractor. The furrowers cut and fill the furrows twice a year one at urea drilling and again at sowing.



By their very nature, raised bed paddocks are a complex of raised soil areas set between surface drains. These surface drains of course are the first areas to get wet and the last to dry out. In particular, trafficking through headland drains has proven very difficult in some paddocks which have little slope. Southern Farming Systems, with funding from the GRDC have a headland management project established on our concept farm at Winchelsea. The following photos summarise part of our attempt to better manage our headlands. The headland chosen is relatively flat but very low-lying and it has proven difficult to move water out of the paddock previously. As we all know, the main collector drains need to be open to move water quickly but safely from the paddock. To remove the remaining puddles and other surface water we have modified the main drain with three treatments. The first is using large (40mm - 200mm) crushed rock to act as an underground drain and provide a firm surface for the tractor. The second is an underground drain (100mm slotted plastic pipe) backfilled with 40mm clean gravel. The final treatment is a control. These three treatments are replicated twice down the headland.



1. Using a dumpy level we determined the falls we had to play with and engaged a roadgrader to widen (25m) and heighten (650mm) the existing wide raised bed headland. With the roadgrader we placed a slope on the apron between the ends of the beds and the main drain. For our purposes, the main drain is "V" shaped and not flat as normally recommended.

2. The roadgrader deepening the "V" drain by about 300mm ready to backfill with large crushed rock.



3. A backhoe digs a trench about 400mm deep ready to install the underground pipe for our second treatment. Although we used a 300mm wide bucket, probably only a 100mm wide trench would be required.



4. The 100mm slotted agricultural drainage pipe laid in the trench.



5. To relieve the drainage water from each treatment a drainage pipe has been taken across the headland to the fence line.



6. One of the finished large crushed rock treatments.

7. One of the finished underground drainage sections backfilled with 40mm clean gravel.

