



IRRIGATION RESEARCH & EXTENSION COMMITTEE

2006



FOR IRRIGATION CROPPERS

Drive over banks

NICHOLAS MORONA

Ph: 0429 846 616

Email: morona@bordnet.com.au

IREC

C/- CSIRO Land and Water, Griffith
Private mail bag 3 Griffith NSW 2680

Tel: 02 69601550 **Fax:** 02 69601562 **Email:** irec@irec.org.au

Origins of Bank

Most farmers over time have knocked down banks. The fields that were sown perpendicular to the fall do not drain as fast as the fields sown parallel to the fall. Once we saw these benefits we wondered what you could do if you could drive over rice banks.

Funding

With a goal and help from SRI and AFFA and sponsors Elders, Armstrong's of Finley and Conargo Shire, we started to trial a new bank.

First Attempt

The first attempt was done with a laser bucket and scraper. The results were good but it was too expensive. This is due to the fact that we had to cart dirt in with the scraper to keep the furrow shallow. Plus, forming the bank with the laser bucket tended to flatten out the bank and therefore use more dirt. The cost for these banks on 20ha was \$4000.

Second Attempt

The second attempt was done by using a road grader. This would enable us to keep costs down. Four passes with the road grader gave us a cost effective bank to trial. The cost was \$1500 on 40ha. However, when we drove over these banks we realised that they were too steep and therefore too hard on our equipment. Both the airseeder and boom spray operations had to reduce speed. The airseeder with spring tines cracked the knife plates while digging into the bank and then releasing with a hard jolt. We realised that a floating hitch, hydraulic tined seeder or a disc seeder would be necessary.

Third Attempt

Another 40ha field was trialed again using the road grader, but with a smoother bank. The cost was still around \$1500/40ha and the banks were successful. The wheat crop was sown and sprayed. Only a slight reduction in speed was required. The field was watered and drained faster than normal considering that it had a fall of one in 3000. This paddock has always had some waterlogged patches of crop, yet in the hot spring of 2004 no water logging occurred.

Benefits of the New Bank

1. Increases in area range from 5 to 10% depending on the number of banks per given area. For example a 40ha field 600 metres wide with only 10 banks 4 metres wide, covers an area of 24,000sq metres, which is 6% of the total area.
2. Better drainage is achieved because in normal contours we sow perpendicular to the fall, creating mounds that hold water back. Now, with this new bank we can sow parallel with the fall, so that the mounds and tractor tracks act as furrows and beds to drain water to the furrow of the new bank, only a short distance away (50 to 80 metres), unlike border check or beds where the water has to drain at least 400 metres. In a wet winter I believe this system will perform better than a border check layout. I feel this bank works best in flat layouts, like one in 1500 to one in 3000, so that banks can be lower and be easier to cross over, and still increase drainage.
3. The new bank lets you sow the paddock as one field, which eliminates corners in each bay, therefore increasing sowing area, decreasing machinery time and minimising gaps that grow weeds.
4. The new bank eliminates overlapping as there is only one field.
5. No weeds because as you sow and spray over the banks they are eliminated therefore reducing the weed seed bank that the wind and stock normally spread through the paddock.

6. Being able to work in long straight lines within the paddock reduces machinery hours saving labour, fuel and wear and tear on your equipment.
7. Access for vehicles and stock is greatly improved, making it safer and faster for both to cross. It has reduced the incidence of sheep being stuck in the toe furrow and mismothering of lambs.
8. Another benefit we have found is that the wide shallow furrow can be lasered with a road grader with a fall of one in 5,000 to 10,000 to increase drainage to the side ditch.

Negatives of the New Bank

1. Road grader operator needs to be told clearly what to do otherwise the correct angles may not be achieved.
2. In autumn 2005 we had problems when watering canola stubble. The short burnt stubble formed a layer in the wide furrow, keeping it very wet and boggy and stopped us going over the banks.
3. In the first year of making the banks in a sub paddock the topsoil needs to be put back on the wide furrow to ensure good pasture growth.
4. Harvesting can be difficult because you have to adjust the harvesting height very quickly when travelling over banks.

The Future

In the future we will be able to use controlled traffic with GPS guidance to make compacted wheel tracks to drain the bays even faster. GPS will minimise overlapping and save 6 to 7% input costs.

While doing the trial of the new banks we have realised that if we try different irrigation layouts we can irrigate faster and drain faster by having a side ditch on one side and a channel on the other side, feeding every second bay, or each bay.

Attempts to knock down the old contour banks after harvesting rice and sowing with the fall have been unsuccessful because of the sticky clay centre of the bank and wet toe furrow. If rice was grown with these new banks that were topped up with a road grader, would it be possible to lower the banks and to harvest (like the Americans do) and sow over the new banks?

We need to trial different seeders like floating hitch, hydraulic tines, parallelograms and disc seeders because the ridged framed airseeder is simply not designed to sow over banks.

Conclusion

Doing the trial of this new bank has opened up a lot of possibilities, a lot of positives and some negatives. We believe the positives and the future gains will far outweigh the negative hurdles. Maybe by using new techniques, we may be able to grow high yielding crops with only one irrigation per year, rather than converting to spray irrigation or drip systems. Plus, you will be able to grow rice on the same layout. Thank you to the sponsors who have helped.