

From Cultivation to No-till to Tramline Farming

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We decided to change our farming system in the mid 90s when it was decided we couldn't get the best out of a stock system and a crop system at the same time.

Some reasons for this were :

1. Sand movement from wind on bare soil surfaces was not sustainable.
2. When removing grasses from good legume pastures to control root disease build up for the following cereal crop, the sheep didn't have a balanced diet on pure legumes so were not performing as they should. These medic type pastures were also harbouring nematodes that damaged the roots of the following cereal crops preventing them finishing properly in a dry finish. Also the selective sprays used to remove grasses were the same as used in a grain legume or canola crop so not giving a rotation of killing modes to avoid chemical resistance.
3. Wind erosion leading up to and during summer on legume pastures after sheep was frustrating .
4. Stock were also removing residues that should have been recycled back to the soil for organic matter that have many benefits to soil life.
5. Stubble laid over by stock walking on it made seeding trash flow difficult.
6. Bare or low residue covered soil were drying out and getting hard.
7. Sheep grazing on wet soils were packing the surface making it hard.
8. Burning grass residues to control disease or prevent seeding blockages also dried out soils making them hard.
9. Cultivating the soil was breaking down its structure and lowering carbon levels and also causing hardening.

These hardened soils were holding back the seeding program on lighter or late rainfall seasons where the biggest yield potential comes from earlier seeding. Wide cultivator points were ripping out old stubble leaving it loose on the surface making it prone to bunching together by wind or moving with water into dams or on fence lines. Due to the above we decided in 1996 to get out of sheep and continuously crop the total arable farm with a no-till system.

NO-TILL DEVELOPMENT

Moving into continuous cropping still had some stubble handling problems at times with cultivator points still too wide at 100mm (4'') and a 175mm(7'') tine spacing. This was ripping out stubble and blocking the machine. We then tried 50mm cast points and stubbles were cut no higher than 30cm. With no stock to knock down stubble this system worked better but still had some blockages and we decided it was still to much cultivation. A triple disc seeder was also purchased to try even less disturbance and also for situations where the tine machine may block with residue or pull up too many rocks. A disadvantage of this machine is that as residue levels rise we are finding more hair pinning of stubble around the seed and with a coating of residual chemical on this layer of residue, it is causing crop damage and at times poor germinations.

A new seeding bar and airseeder cart were purchased in 1999 with 25cm (10'') row spacings and 12mm wide points. The machine was lengthened in depth from front to back to give more clearance around tines. This worked better but still had some stubble blockages. I wish we had made the move to knife points years earlier instead of slowly working our way down through the point sizes. We still use this 12mm points now and love them.

AUTO STEER

We tested a GPS guided auto steer tractor in 2002 so the traditional round and round working of paddocks moved to up and back straight line working the following year. This enabled us to sow down between last years stubble rows so not ripping out standing straw making trash flow a real breeze.

An example of this potential showed when we decided to harvest some frosted wheat by cutting just under the heads to slip over green ones that had shot from the bottom of the plants. This left tall stubble to seed into the following year that didn't give any trouble while working between old rows but due to GPS programming we sometimes got every tine over an old row ripping it out blocking up really bad. Also tall stubble infected young plants with leaf disease when a similar crop type was sown the following year. Now no crops are left tall to seed into.

TRAMLINING

Setting up tramlines became easy with our existing auto steer tractor so a decision to match as many machine wheels to the same width wheel base was made. The harvesting machine determined this as it could not be narrowed under three metres. The articulated tractor was traded on a 3 metre wide track tractor and the existing air seeder cart only needed the rim centres on two wheels moved out 90mm.

Fortunately the boom spray was due to be replaced so a new one was ordered with a hydraulic movable wheel base to 3metres and a three times seeder width boom. Our existing spray tractor had its axles sent to Queensland to be widened out to three metres.

A seeding bar of 12 metres was decided on to try and match a harvesting front. Our existing 16mt (52ft) air seeder bar had its wings removed and all tines were made the same spacing on either side of the machine so we could travel in either direction the following years and still match tines to old stubble rows. A 300mm (12") row spacing was chosen so that when sowing on wider rows by removing every 2nd or 3rd row we could use a shrouded sprayer in legumes or summer crops. This sprayer can spray fungicides up each side of a crop row and over the top as well as a knock down on any weeds between rows.

After moving to tramlines we have noticed that if a heavy machine drives in a different direction to the tramlines it can be seen in the retarded crop growth in the following year right through to harvest. We haven't put a yield to this but it gives an indication of compaction by machines now that the soils are staying softer from less traffic. Sometimes this effect lasts for years.

We can now start seeding at a certain date instead of waiting for a rain to soften the soil. We know we can germinate a crop on 5mm of rain if already sown with a V shaped trench above it to harvest water.

HARVESTING

Straw

The harvesting machines cut the 12.3 metre(40ft) seeding width with centre mount platforms and all straw is chopped. As crop growth got heavier the spreading of residues wasn't wide enough causing some seeding blockages with thick layers of residue. Also when harvesting on the same tramline every year with the residues not spreading the full width of the fronts, especially into the wind, uneven nutrition and organic matter levels would develop over time. To overcome this we developed our own spreaders to give a wider coverage. These will spread chopped straw the full width into a 20 klm hr wind.

Weed Seeds

With tramlines not sown it has enabled us to place the weed seeds separate from the straw out the back of the header onto one tramline. We then spray these rows out in the crop during the next growing season with a knock down herbicide under a hood mounted behind the wheel of the tractor. Some of this is sprayed in the same operation while running the big sprayer over the paddocks or just as its own application. This system is used to prevent applying crop selective chemicals of which weeds became resistant to. It's another tool to keep resistant weeds under control. At present we are trialling a 1000 degree flame burner to attempt killing weed seeds and so not relying on chemical.

Windrowing all residues out the back of headers then burning the rows for weed control is not an option as we want to return all the straw for organic matter, microbial food, moisture retention and erosion control.

Chaser Bin

Chaser bin is matched to tramlines and travels on them all the time except when actually emptying the header when the left hand wheels are moved to the right hand tramline having one set of wheels off the tramline. This is not perfect but is 80% there. We plan to address this after other tramline changes have been made.

SUGGESTION

If wanting to spend the least amount of dollars to give tramlining a go, just put auto steer on your seeding tractor to sow straight crop rows that can be easily followed by your other machines.