

Bale-up Those Weeds: a conversation with farmer Dan Wilson

Written for the GRDC Stubble Project by Mike Roberts Communications, Research and Consulting

According to Elders agronomist Michael Brougham, the emphasis is now on stubble management and harvest. How do you maintain the stubble and how do you work with it? When you retain stubble, weed management can be a problem. “When we were burning and cultivating we could get control of weeds but we all want to retain our stubble now because of the benefits like reduced wind erosion, evaporation and soil temperature. Plus, when we control our weeds long term we don’t want to use chemicals all the time.”

Dan Wilson’s advisor Patrick Redden from Rural Directions reiterated that there’s been a push in recent times to control weed seeds at harvest instead of allowing them to replenish the weed seed bank. We have seen the development of narrow windrow burning, chaff carts and seed destructors; all with their own benefits and problems. Seed destructors are brilliant but expensive and can slow harvest operations. Narrow windrow burning is cheap but can be risky. The chaff cart has been around since 2000, but dealing with the piles they create can be problematic. Sometimes they can burn for a week or more and reignite in dry, windy conditions.

Dan Wilson has had success by combining windrowing his crop, using a chaff cart to collect the weed seeds and then baling the chaff to create additional value in his cattle operation and off farm sales of the chaff bales. Here is his story.

Farm Background

Dan and his wife Suzie are part of a family farm trading as SE, HB, DS and JW Wilson in the Mid North of South Australia at Whitwarta. His mother and father, Helen and Jack, brother Joe and uncle James McColl all work together.

The property typically gets 300-350mm of annual rainfall onto the sand over limestone country. They have some heavier ground as well. For many years rotations have consisted of: Legume (vetch or peas) / Wheat / Barley / Barley.

Machinery

Seeding equipment consists of a 18m Borgault seeder on 250mm spacing with hydraulic tines and knifepoints. They have just acquired a new John Deere 4940 self-propelled spray unit.

Two John Deere harvesters, an S660 and a newer S680 complete the machinery snapshot.

The Wilsons wanted to increase their cattle numbers and to do that; they needed a reliable, additional feed source. They also had a problem with brome grass over their sand hill country and thought that a chaff cart might help with solving both issues. They began using one six years ago.

“The first year we had our chaff cart we were reaping barley on our sand hills and the chaff heaps were all purple because of the number brome grass seeds! It was pretty bad. There is still some brome grass out there now but it’s minimal. We could never get a proper crop on top of the sand hills in those days because it was just choked out. Nowadays we get 3-4 tonne crops there because they are not competing with the brome.”

Header modifications

One of the headers has already been, and the other is about to be, modified for use with a chaff cart. Dan found out about a Perth manufacturer who has been designing plates and shoots for chaff lining in WA. The device narrows and concentrates the row of chaff coming out of the back of the harvester. It was intended for farmers who didn’t have stock and would leave the chaff on the ground to decay over the next season, destroying most of the weed seeds in the process.

Using this modification to concentrate the chaff discharge into a cart meant that Dan was able to get much more of the weed seeds into the cart even though, he says, “that’s not what it was designed for.”

“The 660 has a big tow hitch underneath and couple of added shoots in the back that divert all the seeds down onto the belt of the chaff cart. Rightways at Bute made the cart. Anything off the sieves, like grass seeds and small grain, all goes down there while all the other straw goes through the chopper and then gets spread out. Otherwise it just fills up too quick. The plate and the shoot is the modification. We are getting a new chaff cart for the John Deere 680 as well as getting this modification made.”

Windrowing the barley

The other key part of the Wilsons’ program is their windrower. Because their rotation is 50% barley it means they can windrow that crop close to ripening and reap it off the ground sometime later. Cutting can occur 7-10 days early if carefully monitored. Enough moisture remains in the stem to finish the grain off.

The advantage is that a week before harvest the grasses such as wild oats are likely to still be holding their seed. “We just have to make sure that we have a sharp knife and go a bit slower so we are not pulling it. We know that all our weeds are going into the windrow and we won’t lose them even if we don’t reap for another three weeks. If we didn’t windrow, those wild oat, ryegrass and brome seeds might have shattered off with wind or fallen between the rows and the header wouldn’t pick them up.”

“Getting the timing right is important. If you can push your finger into the grain and make a print with your fingernail, it’s still a bit soft. That is about ideal to windrow.”

How did you progress from chaff dumps to baling?

Baling the chaff out of the cart has only been happening for two seasons. Dan’s good friend Justin Michael owns the baler and he suggested they try it out. Until the two actually saw it working they thought it was unlikely to make a good bale. However, in the paddock they first tried there was a 550kg bale every four metres!

“It wasn’t really difficult and we just got straight into it. We thought the pickup where the fingers are was just going to cut through it like butter and wouldn’t bring it up into the machine, but it did. Justin’s tractor has a power shift transmission so where the rows are as wide and high as a table he had to ride the clutch a bit to go slow enough. Usually hay rows are smaller and you can do 12k/hr but he’s going about half a kilometre an hour. If he had a different transmission that would allow him to go at a snail’s speed it would pick up a lot better.”

Because of their windrowing practice the Wilsons are usually one the first people in the district to start reaping. “Justin can generally fit our chaff baling in between his export haymaking jobs and his grain carting, which hasn’t cranked up at that early stage. After that he’s flat out carting so we wait until harvest is done to get him back to finish. The problem with that, of course, is that we can’t run any stock in those paddocks where we are going to bale, so the cows wont ruin the chaff. The more we do early, the better.”

At first the alarm bells went off about the possible cost of baling that much chaff. However Dan knew that from a feed value perspective, his cattle were wasting more than half of the chaff dump piles they were using by climbing up on them and urinating on their feed. “After that they won’t eat them.”

The Wilsons have some swampy country with planted saltbush that gets used as a feedlot area. As the feed in the paddocks runs short in the lead up to sowing vetch for the new pasture paddocks, cattle are put into the swamp and fed from big feeders. “Feeders are on the ground and the cows can get their heads in but can’t climb on the feed. They are just fat all year round now!”

Exactly how does the operation work?

Once the barley is reaped and the chaff is captured, it needs to be dropped into a pile. It’s easy to drop it all at one end of a paddock but Dan has found that making smaller piles at both ends is actually better for raking and easier for the baler to handle.

“I go through with the hay forks about a foot off the ground and just bulldoze it, push them everywhere. Then I turn around and come back the other way with

the v-rake and it bring it all into a nice neat row. Then the baler comes in and in just one pass it's done. If you have a paddock where you are dumping on one end and then other and the piles are half the size and you can just go through them with the loader and the rake at the same time in one pass. That's more efficient and you don't have to push them around as much. The more you push them around, the less the rake is going to grab and the more seeds you will leave on the ground."

Surprisingly, the areas where baling has taken place don't seem to become weed problem areas in following years. Dan says it is a bit like chaff lining and the moisture rots down and destroys the seeds remaining in the chaff on the ground. To date he hasn't had to use knockdown herbicides on those areas.

"We ran into problems this year where we did some baling where there were old chaff heaps. I dropped the chaff too close to them and the old soggy material was still there. The rake was grabbing some of it and flicking it in the new windrows.

That's going into vetch this year and then we will have wheat on it the following year. When there's a big thick wheat stubble over those chaff heaps we will burn it back to start again. We only end up burning every four years instead of every single year and that's a good thing."

"When we do light them up now we use a little 40 foot cultivator, which we drag through to stir them up and it burns a lot quicker. We do 6 or 7 passes over it until it's just bare dirt. No dramas then at all."

"We only bale chaff two years in a row during the barley phase because we are not going to keep the wheat chaff anymore. Unless you are wasting a heap of grain with your header there's not much feed value. It would still be useful if we had lots of weeds seeds but that's not the case in our wheat anymore."

The Wilsons had a bad experience trying to bale vetch chaff when a big rain soaked into the piles and ruined it. "With barley we find it gets a bit of a crust on it and only wets around the outside and isn't as likely to be spoiled. Maybe the conditions just weren't right that year and it turned us off."

Timing of the baling operation can be important. As soon as Dan starts reaping the barley he tells Justin to drop his rake out on the farm. Once Dan makes a start on raking the baling can begin. "Our stock are really looking for feed then and we want to get them out on the stubbles but we have to get the chaff dumps baled and out of the way so they don't spoil them."

Advantages of feeding out bales vs feeding out the chaff dumps? A market for bales?

Reducing weeds is the primary focus and baling is certainly a way to reduce the wastage of cattle trampling chaff dumps. Finding a market for additional bales that a farm might not have the stock to consume could be even better though. In

the first week of February, Dan Wilson sent a road train up to his cousin's cattle station near Whitecliffs as part of a trial. That was only one week ago at the time of writing so they are still waiting to hear how things are going.

Dan doesn't think that introducing weed seeds up on that country will be a problem as normal conditions are unlikely to favour them. With some indication of how much the station might require, the Wilsons should be able to bale enough to suit their needs.

How much to bale?

The Wilsons are using round bale feeders that the medium square chaff bales fit into quite well. Their 100-120 cows and calves appear fat all year round now. They also have 6-700 sheep on the home block and another 400 in shares with a farmer at Auburn. These sheep are carted back and forth to better utilise stubbles post harvest.

"The sheep don't really touch the bales. They prefer to go along and pick at the leftover heads and grain off the ground so it's really just for cattle. We don't really know whether this will be a goer for sheep cause no one has really trialed it."

Dan is still trying to work out how many bales to keep for the cow plus sales off farm. "We don't know really. If it rains in Feb-Mar then we might have a bit of feed around. Last year we kept 150 bales and we still have 20. We've only done 50 bales this year but still have a bunker of left over loose chaff that we carted down with a tipper."

"It's just so much easier baling it though. On a flat top you get 33 bales of chaff x 550kg = 18 tonnes. You only fit about 3 tonnes of loose chaff in a tipper. So the time it takes to cart it off your paddock is huge plus you are rattling back and forth across your paddock in a truck, compacting your soil too many times."

Feed value of bales?

Feed value testing of the bales will begin soon but the Wilsons are aware of testing done nearby, south of Balaklava, about ten years ago on Mike Tiller's farm. Those tests indicated that barley chaff was very similar nutritionally to Grade 3 oaten hay. At this point the cattle do not receive any supplementary feeding during the year and look great. They do have access to stubbles.

Covering costs and then some?

"We are catching the weeds, getting it baled and putting it in our feed lot. That means we can run cattle the whole year round instead of buying then in when we have feed and selling when we don't. We can just keep them all and breed from them."

“We haven’t really sold any bales yet; just trialing to see if we can make money off it. If they like it in the station trials we can then charge a fair price. For now we are just covering costs for the trial at around \$23 per bale. If the station folks and their neighbours want more we might put a price of \$60 per bale on, depending on the feed tests.”

“Weed control is the number one reason why we use a chaff cart and bale. With current cattle prices, our 3440 hectares and the chaff cart we have been able to run at least 50 more cows. A chaff cart costs around \$36k and since we bought it we have been making \$60-70k on the extra cattle we have been running. It pays for itself 1.5times every year just by running more cattle.”

Weed control

Before the use of the chaff cart Dan just relied on chemicals for his weed control. They used a pre-emergent prior to seeding and then had to move to Clearfield varieties. Since putting the chaff cart to use 6 years ago most paddocks just get 1.2-1.4L/ha of trifluralin. “There are hardly any weeds there.”

Weed control where baling has taken place

The weed control where the chaff cart and baling has been used has been excellent. “Black and white really. Where we have had breakdowns with our chaff cart and have just unhooked it and reaped without it we really notice the increase in weeds. If you can get the weed seeds in the front of the header and it’s operating properly the seeds are either going to the silos or into your chaff cart but not on the ground. The bigger the seed, the more likely it will end up in your chaff cart.”

“The one weed that is easy to miss is barley grass because it goes off early and once it does it lays over. I have heard of people reaping wheat the opposite way to sowing and using crop lifters to pick the ryegrass and barley grass back up to get it in the header. We haven’t tried that.”

Which crops to bale?

The legume phase of the rotation sees vetch sown in the frost prone areas to make hay or pasture for the cattle. “Everywhere else we do peas and then the following year we do wheat. We follow that with two years of barley where we catch the chaff.”

Dan thinks that a chaff cart is still a good option for farmers with lots of weeds in their wheat crops but notes that cattle prefer the barley chaff. “We don’t use it in wheat because it’s double the chaff to deal with and you get more feed value out of the barley. But if we had a lot of weeds in the wheat we would be using it for sure. Last year we missed a spray and had heaps of wild oats in one wheat paddock so we hooked the chaff cart back up on the bad part of the paddock.”

Chaff cart and header efficiency

“Pulling a chaff cart is like towing a big caravan behind your header. You can’t turn sharply or it hits the back tyres. It does slow you down a bit on the corners but we tend to do swap laps where we miss a lap, do a big arc, drop the pile and then go straight back down the other row under GPS guidance.”

The cart doesn’t seem to have too much effect on fuel economy either. “It puts around 300kg of downward pressure on the drawbar. The new chaff cart runs off the hydraulics of the header that would normally be running the powercast discharge beaters. We take them off and put on the normal tailboard off the chopper. The horsepower from that just runs the belts on the chaff cart. We don’t have to go slower and even when we are dropping chaff I don’t slow down. I just do it on the run.”

The older chaff cart is a Rightways and has a floor that lifts on emptying. The new Smart Cart is “like a hatch back car with the floor already tilted. You can adjust the hatch opening to give an even spread on the ground to save pushing it with the loader. That means the chaff row will be in one neat line ready to rake.”

The older cart is rated at 18 cubic metres capacity but in reality only fills up to about 12 cubic metres. The new Smart Cart holds 40 cubic metres. “ That should allow us to go four ‘up and backs’ before emptying along the fence in a neat row.”

The 660 header has a 10,600L box, which fills 1.5 times to one 12 cubic metre lot of chaff. The first 88ha paddock reaped this year yielded 3.8 tonnes per ha of barley and produced 47 bales of chaff weighing 610kg each.

With the new 680 header equipped with a 12,500L box and the Smart Cart, Dan estimates that 4 boxes full of grain would produce one full 40 cubic metre cart.

Dan Wilson is happy to help out if anyone wants more information. “It’s a good program, using the old chaff cart! The addition of baling is a great way to make it work and get lots of benefits without the cost of an expensive machine.”

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