More ground cover equals more moisture

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Moisture retention has become an even higher priority for NSW continuous croppers David and Peter Ricardo since they added dryland cotton, a summer crop, to their cropping program.

Conserving soil moisture is always front of mind for northern NSW growers David and Peter Ricardo.

The brothers run a 9,000ha continuous cropping enterprise between Walgett and Collarenebri, where low growing-season rainfall and the full gamut of extreme weather conditions make moisture efficiency a game changer.

"Between November and February we get most of our rainfall from summer storm events. This is when we fill up the soil profile and take advantage of the tremendous water-holding capacity of our black soil," said David Ricardo.

The lowest period of rainfall on the Ricardos' farm is in August and September. While conditions in these two months are crucial for grain fill in winter crops, the property receives only about 12% of the 475mm annual rainfall in that period, which means maturing winter crops rely on soil moisture stored from previous seasons or years, said David.

While the brothers are currently experiencing a run of very dry conditions, when the region does get good rain their floodplain country is inundated, which fills the soil profile with moisture. "Every hectare goes under water. It's not very good if you've got a crop to harvest, but if it's during summer it's fantastic. The main thing is that it dries out just enough to get a crop sown," said David.

"The big thing of course is that it fills the profile. With a full profile we've got 250mm of soil moisture to use for the next crop, and with good management, and depending on the timing, we can sometimes get almost two years' moisture from a flood."

Zero-till croppers for the past 30 years, the Ricardos' two key strategies for moisture retention are crop rotation and ground cover preservation. In a program that includes wheat, barley, chickpeas, faba beans, some canola and more recently cotton, strategically-planned winter cereals provide protective stubble loads that have become even more important since they began experimenting with dryland cotton, which is a summer crop. These early efforts have been quite successful and cotton is now part of their plans going forward, although its future in their program depends on their ability to retain enough soil moisture.

"We like our cotton so we've got to get better at conserving moisture and we believe the best way to do that is to plan ahead and look closely at our crop rotations," David said. "We'd like to grow cotton on up to 30% of our country every year. To do that we need to set up the paddocks where we want to plant cotton by growing cereal crops generating plenty of stubble in the year before the cotton and keeping that coverage on the soil for a long fallow period ahead of planting the cotton," said David.

With this in mind they have begun using a Shelbourne stripper front to harvest their cereals because it leaves tall standing stubble. "The stripper front is just so much better at keeping stubble taller and leaving more cover for longer, which is the only way we can lift our moisture efficiency from around 25%, which is the average for no-till crop around Walgett, to around 30%, which is what we are aiming to achieve."

The stripper front has also improved their harvest efficiency. "Pushing the harvest efficiency of our header was something we were quite unprepared for," said David. "When everyone using draper fronts has to knock off at midnight because of tough

straw we just keep going. The bottleneck is the cleaning capacity of the header and leaving the straw in the paddock instead of cutting it and putting it through the header means the machine can continue handling the grain. It has also improved our fuel efficiency by 30%."

Ground cover is also the Ricardos' main line of defence against extreme weather conditions. "Ground cover is ultra-important because our greatest asset is our soil."

Drought, heat, frost and sandblasting wind are all part of the farming experience on the north western plains of NSW, which are currently experiencing drought conditions, with rainfall at an all-time low according to records dating back to 1900. "It's very dry at the moment," said David. "We've had a series of drought years and most guys in the Walgett district would have lost five out of the past six or seven seasons. A lot of country is blowing away,"

The Ricardos are early adopters who were also among the earliest in the Walgett district to grow chickpeas, which they planted for the first time in 1990.

Introducing chickpeas was part of an initiative to broaden their crop rotation and reduce their reliance on wheat and they now haven't planted wheat on wheat for 30 years, said David. "I think we've been lucky. As young blokes my brother and I were open to all sorts of suggestions and we had an agronomist who said, 'you can't grow wheat on wheat because of disease and crown rot and all these different issues', so I think we picked up on that early.

"Initially we didn't know how to handle chickpeas, it was a hands-on learning experience as we went. It was difficult for a few years but we've really fine-tuned our chickpea management now."

However, there are always hits and misses, with their experiences in 2015 and 2016 providing a ready example of the highs and lows experienced with the crop.

"Our chickpeas in 2015 averaged 1.5t/ha or a bit less. It was a tough year and we had to literally shave the ground with a flex front to get the crop off.

"In contrast, 2016 was about as good as it gets for us. We harvested about 3t/ha that brought about $800 a tonne. It doesn't get any better than that.

"The interesting thing about that crop was that it didn't flower until later. It was the end of August and the crop was about knee-high before we even saw a flower. It was just doing it so easily with the conditions and the moisture in the system."

The 2016 chickpea crop was also instrumental in enabling the brothers to produce a bumper wheat yield in conditions in which the rest of the district failed to produce a crop. "The chickpeas didn't use all the moisture and we had a little bit of a storm during summer so we were able to deep sow our wheat and get it established when nobody else was able to."

As was the case with chickpeas, growing cotton has been a 'learn-on-the-job' experience for David and Peter, who in late October 2016 decided to plant 3,000ha of dryland cotton when they received 100mm of rain after three successive years of drought.

"It was an exciting time because we'd never grown cotton before. We'd seen it on our doorstep on a couple of neighbours' irrigation places but it was one of those things where we hit the ground running, just learning as we went," said David.

"We had the agronomist out every week looking at problems, looking at bugs. We

lost some of it to sandblasting, some of it to chemical damage. It was a real learning experience but overall it was a successful crop."

In 2017, after good falls of rain late in 2016 that refilled the soil profile they followed the cotton with a chickpea crop that yielded 2.5t/ha.

"In 2017 we had the only wheat crop in the district and the chickpeas did two and a half tonnes a hectare. I attribute that to cotton having changed our management strategy. Having a summer crop in the system has turned our system on its head, in a good way. We want to get to the point where we're growing cotton every year. That's the goal."

However, the brothers still have plenty to learn about growing the crop.

Despite having plenty of soil moisture at planting their 2017 cotton crop suffered due to the heat, providing another learning experience.

"Ultimately the 2017 cotton crop had a number of problems but the biggest issue was the summer heat," said David. "The crop was never able to cool down because temperatures at night during February were mostly warmer than 35°C, so flowers on top of the canopy suffered."

Not one to sit idle, during recent drought periods when there has not been enough moisture to grow chickpeas or cotton, David has used his 'spare' time to develop an app – Farm Service Manager – to manage the brothers' machinery maintenance program.

Farm Service Manager, which is now available commercially, enables growers to maintain comprehensive service records on all agricultural machinery and can be used for service scheduling. More information is available at https://farmservicemanager.com/ and a free demo version is available through Google Play or the Apple App Store.

MIXED COVER CROPS FOR SUSTAINABLE FARMING

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