A tool for every season

Testing the Model 1204 Kelly Tillage System

Model 1204 Kelly Tillage System Case Study
Subject: Select Harvest Paringa orchard, South Australia
Orchard size: 1,130 hectares, clay loam soils
Produce grown: Almonds
Kelly model: Model 1204 Prototype with CL1 & Spiked Disc

Down by the river

South Australia's Riverland region is famous for its orchards, which produce a range of citrus, stone fruits and nuts. One of these orchards is owned by Select Harvest, and grows almonds near the town of Paringa. The orchard spans 1,130 hectares and has 450,000 trees, planted in rows that vary from 6.5-7m in width. Yields average between 4.1 and 4.4 tons per hectare in mature plantings, but are lower in the 350ha of younger plantings.

Though soil types tend towards clay loam, the land is far from uniform. "It's a massive variation to be honest," says Mike Ward, who's Select Harvest's Operations Manager for South Australia. "We've got everything from sandy areas on top of hills to heavier ground, and definitely clay loam increasing in content as you get through the gullies."

The orchard doesn't use any cover crops in the rows; rather, they allow the weeds to grow as a source of pollen for the bees. Though weeds aren't a major issue in the orchard's harvest rows, they're more problematic when growing in the treeline. Weed control is done through herbicide application, which can be difficult in orchards; most chemicals that are capable of sufficient weed kill can also be harmful to the trees. This limits the timing and weather conditions during which a herbicide spray can be done.

Almonds aren't harvested directly from the trees, but from the ground after they fall. After being allowed to dry, the fallen almonds are swept or blown into rows and collected. This process relies on the planting rows being level and free of detritus, making good soil management practices critical for an efficient harvest.

The Select Harvest Paringa orchard usually makes two ground levelling passes per year. One pass takes place in April/May, after the harvest, and the other is around December/January, before harvest. These passes usually use an X-Plane leveller fitted with a 60cm roller or a Loam Bar. The orchard uses 85-105hp tractors.

Trialling the Kelly

The Paringa orchard staff first saw the Model 1204 Kelly Tillage System at work on a neighbouring property. Though he was impressed with what he saw, Mike Ward admits that he initially wasn't sure how well the Model 1204 would suit Select Farms' operation. "Looking at it on another orchard you think 'well, let's see how it goes on our land,'" he says. After two weeks of trialing the machine, however, any doubts have been laid to rest. "At this point in time we've put a few hours on it and it's been really good," says Ward. "We've had comments back from the orchard staff saying 'this is great.'"

The orchard has been thorough in trialing the Model 1204, testing how it works in conjunction with their other machinery. Several harvest rows have been set aside for testing different applications of the tool. "We've tried it without rollers, with rollers, with two passes, all those bits and pieces," says Ward.

The early impression from this testing is that following the Model 1204 with a roller may create a slightly more level surface, but doesn't seem necessary; the Model 1204 is capable of pulling weeds and levelling mounds in one pass, and leaves a suitable surface for harvest. Orchard staff also tried making a pass with an X-Plane leveller after using the Model 1204. The additional X-Plane pass added no real benefit, with some operators suggesting that following the Model 1204 with the X-Plane had left the soil in worse condition than using the Model 1204 by itself.

The Model 1204 has a range of available disc chains for working in different conditions. The Paringa orchard has been using CL1 Disc Chain, which consists of interlinked discs cast from a durable steel alloy. The orchard also has a full set of Spiked Disc Chain, considered to be a more suitable option for sandy soils.

An eye to the future

Sustainability is key in the orchard. “We want to improve soil structure, soil microbes, all those bits and pieces,” says Ward. “We’re doing some composting, looking at ways in which we can become more sustainable.

“We’ve got a plant over the border at Robinvale where we burn all the almond hull to produce power. That ash is then collected and composted through some different formulations depending on the orchards, and we are looking to incorporate that now back into the soil and reduce our synthetic fertiliser use.”

"Even just seeing it [the Model 1204] probably exceeded our expectations"

– Mike Ward, Operations Manager for SA

Predicted improvements

Even after two weeks of use, it seems clear to Ward that there are a range of benefits to be had from running the Model 1204. For one thing, the powerful disc chains aren't impeded by mulch or debris, which can pose problems for other machines. "With leaf litter and the amount of weeds that are in the orchard, we can't get through the rows with anything else to level at this time of year," says Ward. "The Kelly not only gives us greater speed, but also the availability to work almost throughout the whole year."

He also predicts that the Model 1204 could lead to herbicide savings, being an effective tool for controlling weeds. "If we were running this machine through the December/January period after the hygiene pass, we might be able to drop out the herbicide for that section of the orchard. You'd probably do an under-tree spray and leave the mid section because you know you're coming through with the Kelly. We're talking about 60-65% of the orchard floor, so there's definitely some herbicide savings there."

With a working speed of around 10km/h, the Model 1204 is significantly faster than the orchard's other tools. "We're looking at working probably 70-80% faster than conventional methods," says Ward. "Realistically we'd average around 3.5mph with an X-Plane, and by the sounds of it we're hovering around 6mph with the Model 1204."

At this stage, Ward doesn't foresee any issues with maintenance or wear. "As well as the sealed bearings, the overall concept of it [the Model 1204] is very low-maintenance, which is very attractive. There's no alarm bells going off at this time to say 'there's going to be some problems here,' so I think it's quite good."

Unconventional uses

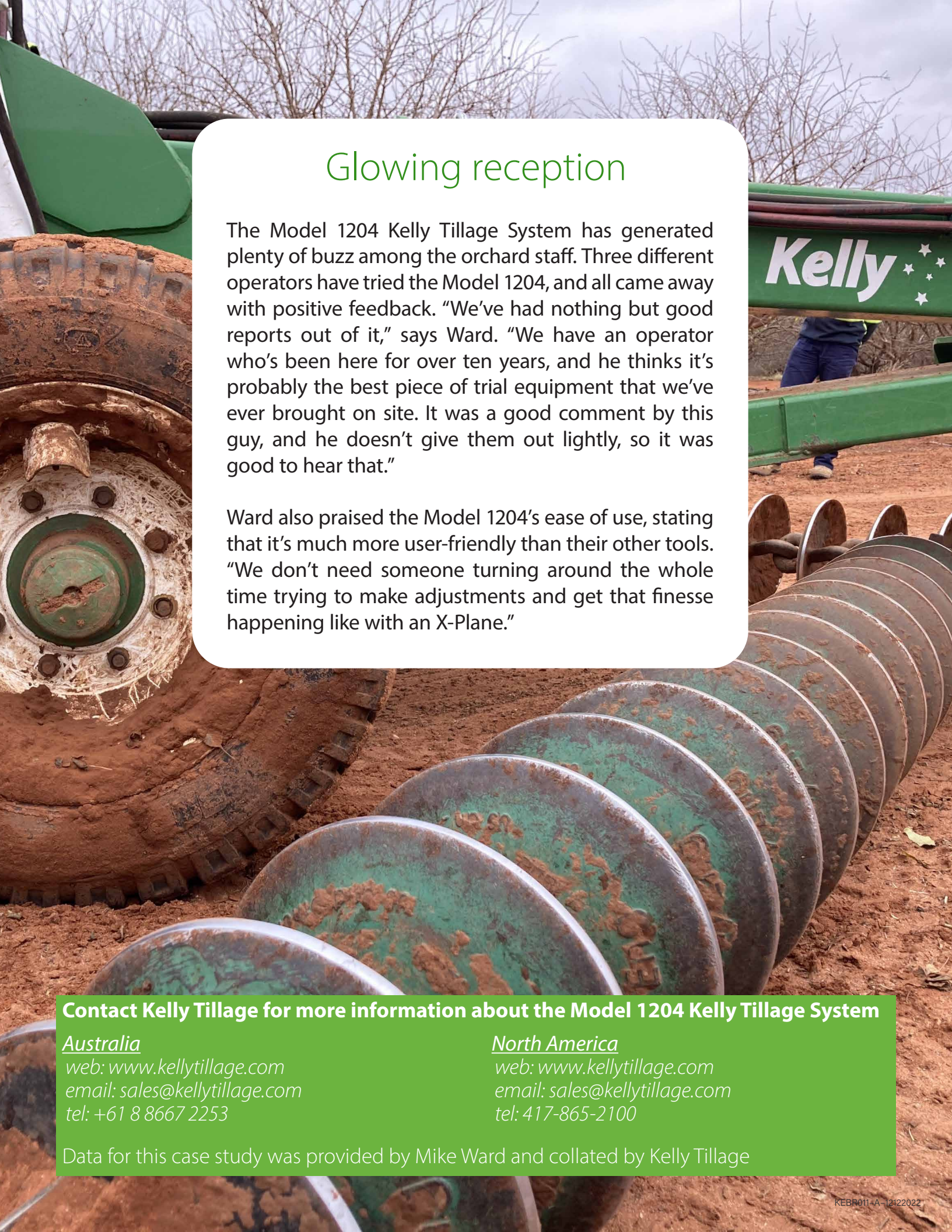
Ward was enthusiastic to find that the Model 1204 offered a potential solution for a long-standing issue with soil buildup. The orchard recently repositioned some of their irrigation drip-lines, which were pegged at a disproportionate distance from the tree line. These drip-lines attracted dirt and soil buildup, leaving behind a raised mound of soil when repositioned. This mound makes harvest work difficult for machinery that needs a flat surface to operate. “In a couple of areas it was quite a distance from the trees where you’d struggle to get harvest machinery down the row and struggle to not run it on the mound,” says Ward.

Chipping away at the mound

CL1 Disc Chain

Orchard staff have had little success attempting to fix the soil mound with their usual soil management tools, but the Kelly Model 1204’s powerful disc chains have shown promising results in this area. “At this point in time we’re using the Kelly to run those discs into that mound and really start to reduce it,” says Ward. Though it’s not an instant solution, he’s confident that the Model 1204 can solve the problem in time. “We don’t think it’ll happen in the first pass, but with two or three passes over that particular part of the orchard we’ll definitely start to see some good results.”

The irrigation mound interferes with harvest



Glowing reception

The Model 1204 Kelly Tillage System has generated plenty of buzz among the orchard staff. Three different operators have tried the Model 1204, and all came away with positive feedback. “We’ve had nothing but good reports out of it,” says Ward. “We have an operator who’s been here for over ten years, and he thinks it’s probably the best piece of trial equipment that we’ve ever brought on site. It was a good comment by this guy, and he doesn’t give them out lightly, so it was good to hear that.”

Ward also praised the Model 1204’s ease of use, stating that it’s much more user-friendly than their other tools. “We don’t need someone turning around the whole time trying to make adjustments and get that finesse happening like with an X-Plane.”

Contact Kelly Tillage for more information about the Model 1204 Kelly Tillage System

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Data for this case study was provided by Mike Ward and collated by Kelly Tillage