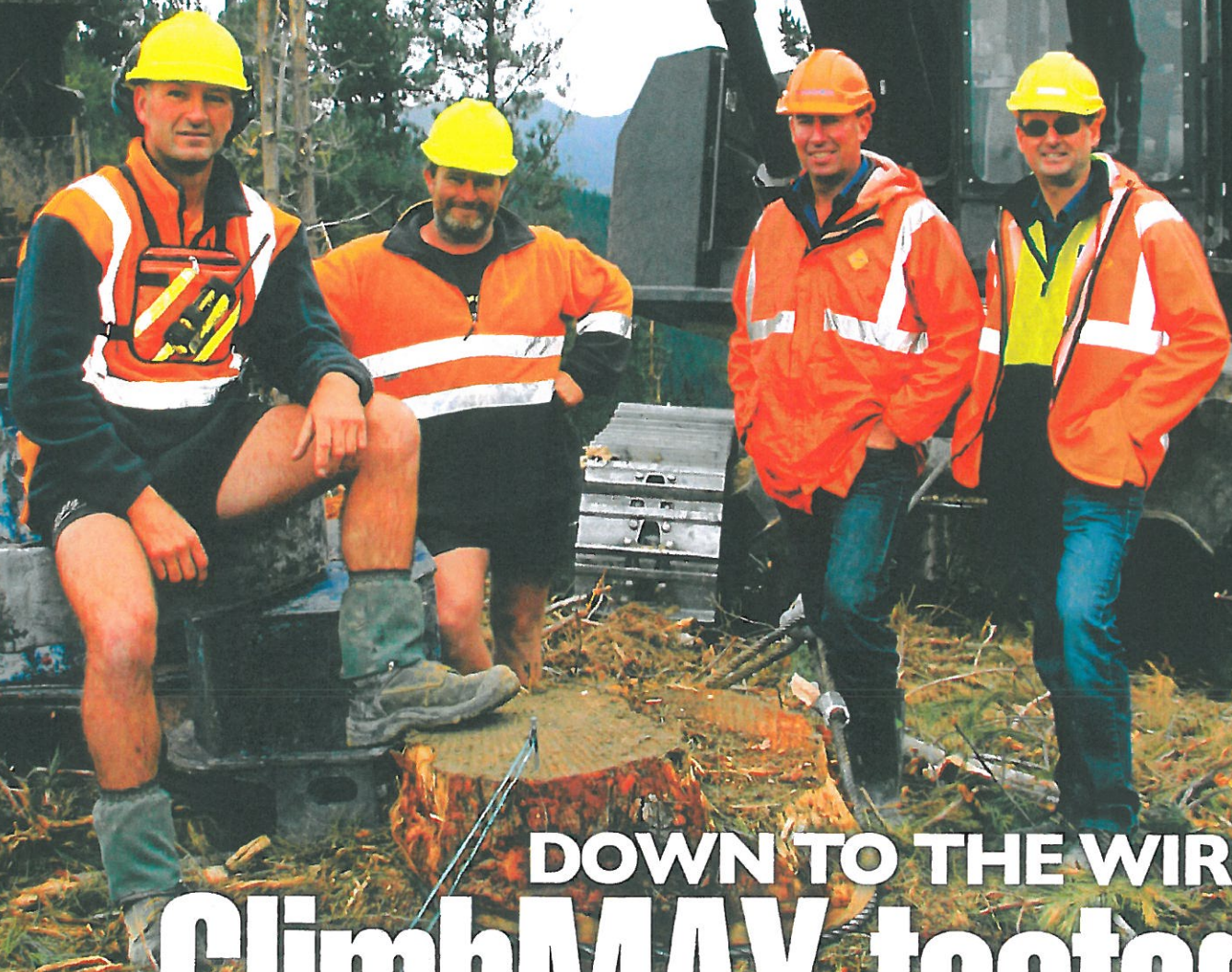


new zealand

# LOGGER

May 2014 | \$6.80



## DOWN TO THE WIRE ClimbMAX tested

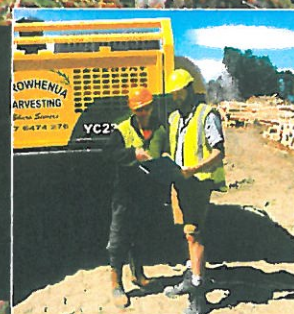
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**KING OF THE  
FORESTS  
STEPS DOWN**



**LANDING SIZE  
IMPACTS  
COSTS**





Iron Tester Stan Barlow gets in amongst the trees.



**E**VERYONE, IT SEEMS, has an opinion on what's the best way to use a felling machine safely and productively to harvest trees on steep slopes.

There are the traditional levelling cab harvesters working freely on medium grade slopes, of course.

For steeper sites we've now got tethered excavators with the winch fixed either to the felling machine itself, or attached to a piece of equipment anchored at the top of the hill. Each different to the other in some way.

So which one is right?

It's hard to say. They are all pushing the envelope, and the safety rules around their use are hardly black and white.

Regardless, you've got to admire the innovative thinking that's behind the approach to getting guys away from dangerous operations like tree falling.

But I've got a special admiration for the single-minded determination of one group of mechanised steep slope pioneers; Nigel Kelly, Kerry Hill and Paul Jensen, who stumped up hard-earned coin on an untried method of mechanically felling and bunching trees on steep slopes long before most others jumped on the bandwagon.

The result, as just about anyone involved in New Zealand forestry will know, is the

ClimbMAX, which is now being made available as a turn-key steep slope harvesting solution for other contractors to purchase.

It's not a mildly or even extensively adapted machine. It's a wholly new product, from the tracks up, designed to re-use a number of original parts, yet built specifically to work on the slopes.

NZ Logger has been itching to do an Iron Test since we first saw the prototype operating in the Rai Valley, between Nelson and Blenheim, early in 2010. It had already put in more than a year's worth of experimental work for Kelly Logging and the ideas and experience gleaned from the prototype were then incorporated into the first production version assembled by Trinder Engineers at its Richmond workshop; the black-liveried ClimbMAX 1 that Nigel has been operating for more than two years.

Since then, three further ClimbMAX machines have been built. The second, based on a Hyundai R320, went to JB Logging in Hawkes Bay nearly 18 months ago. The third, based on Hitachi excavators like Nigel's two previous machines, was purchased by a Canadian contractor. The fourth, which has just joined the Kelly Logging fleet, is the subject of this much-awaited Iron Test, while a fifth machine is currently under construction and available for purchase.

Bring on the steep slopes!

Well, not just yet. Before we get to the

Iron Test proper, let's just recap on the development of what we now call 'winch-assist' systems and why the ClimbMAX team chose to go with the winch built into their machine, rather than on a separate bulldozer or digger up the hill.

It doesn't take a rocket scientist to understand that mechanised felling on sloping sites has its limitations, even when using machines with a levelling undercarriage. But if you can assist the harvester to stay on the hill, by tethering it to a wire rope, you'll open up a far greater amount of trees that can be 'ground-based'. That's the theory.

In practice, designing and constructing a system that seamlessly pays out or brings in rope as the machine works up, down and laterally across a slope ain't easy, as those who have been trying to devise their own 'winch-assist' systems can probably testify.

Tethering machines to work on hillsides is not new. The Europeans have been doing it for some time, mostly with wheeled forwarders and the odd wheeled harvester. All much lighter equipment than a typical New Zealand tracked excavator, which is the harvesting machine of choice for contractors here, because we deal with much heavier trees. And they are used on slopes that are not as steep.

Nigel Kelly hatched his ideas in 2006 and approached Trinder Engineers to turn them into reality. They looked at all options,



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Iron Tester Stan Barlow eases the ClimbMAX over the brow and downhill.

including mounting winches on anchored machines at the top of the slopes (as a number of contractors here are now doing) and also the European system of using a 'bolt-on' winch, like an accessory, rather than being built into the machine.

The European option didn't look like it would work because they use much lighter rope and smaller winches, explains Kerry Hill, who heads up Trinder and is also a shareholder in the ClimbMAX consortium.

Tethering the feller/buncher to a winch mounted onto a piece of equipment at the top of the hill has its limitations – getting the winch machine to the right location to ensure the angle of pull on the wire is right can sometimes be difficult. If this can't be done rope binds are created and rope blocks may

be required, which then brings into question anchor certification issues. Also, many areas where Kelly Logging harvests cannot be accessed from a ridge or a track at the top, so approaching from the base of the hill and working up the slope is the only option, using anchors, such as suitable stumps, along the way. This also allows for greater flexibility when using the ClimbMAX harvester.

The first idea was to simply attach a winch on a digger and go harvesting. It soon became more complicated and, eventually, much more sophisticated.

The original prototype, built around a Hitachi ZX280, has the winch built into the rear of the existing undercarriage and fed back under the machine, through a fairlead at the front, with 310 metres of 7/8ths swage

rope running up to a stump or a deadman securely buried in the ground. For a first attempt, it has worked remarkably well for the past five-plus years, but it is not an ideal machine, being under-powered and too heavy (44 tonnes) for the work it is doing. The hydraulics and electronics are also fairly rudimentary.

Most importantly, there is no secondary safety system that can hold the machine if the rope breaks or the anchor gives way, as prescribed in the ACoP forestry safety book. The only way to comply, they reasoned, was to install a blade that is instantly activated by the operator to prevent the machine from sliding down the hill (see accompanying article 'The Paper Trail' that explains the lengths the ClimbMAX team has gone to in



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*Above:* Phil 'Boo' Valk (left) explains to Iron Tester Stan Barlow how the tension monitor works.

*Right:* Iron Tester Stan Barlow shovels trees up the hill.

*Below:* It looks steeper but this hill is no more than 38-degrees.



documenting functional, operational and safety procedures).

In trying to solve that issue, the team also looked at ways to make life more comfortable for the operator and a second-hand levelling John Deere 959 (the first to come to New Zealand) was purchased. But there was no way the undercarriage could incorporate the levelling system, a winch and a blade, so the first and all subsequent ClimbMAX models do not feature a levelling base. But they are much more sophisticated than the prototype, more powerful and more stable.

That's because they are based around larger machines – either the Hitachi ZX330 or, in JB Logging's case, a Hyundai R320. And yet, they weigh a little less than the prototype, at around 42 tonnes including the felling head and a full tank of fuel.

Effectively, the factory machines are completely disassembled and then re-built as new harvesters, re-using the engine, transmission, track gear and some key components. They arrive on single grouser bulldozer-type tracks, with no counterweight and no boom/arm (but with the cylinders and pins).

It sounds involved, but the way Kerry explains it seems quite simple: "We unbolt the carbody from the slew ring and strip the top off, take the engine/transmission out, take the cab off, then cut the track pods off the base through there (he's pointing to weld seams either side of the slew ring). So there are only a few bits of plate and body panel we don't re-use – maybe a tonne or so."

But when it is put back together, the aim is to get as much weight down low as possible, to improve the

centre of gravity. The tracks guards are beefier, along with bigger top rollers, and many of the components are placed down low. Additionally, the Trinder-designed boom and arm are around a tonne lighter than the factory boom and arm, as well as being longer, and the purpose-built Trinder cab has also been on a diet.

Compared to the prototype, the winch is now positioned at the front and fashioned more seamlessly into the structure, with an all-new blade attached to the rear – both designed and built in-house at Trinder Engineers – which transfers weight further down in the machine. Effectively, Kerry says, they've moved six tonnes of weight from the top of the machine to the bottom. That means the centre of gravity is now at the slew ring, not half-way up the engine bay.

Because it operates at an angle much of the time, the 7.8-litre Isuzu engine has been modified to run with a dry sump so that it doesn't suffer from oil starvation issues and there have been huge changes to the hydraulics and electronic systems (more on that shortly).

Those of you who attended the FICA Big Day Out in Nelson in 2011 and saw the black ClimbMAX 1 unveiled for the first time would agree that it looked very impressive, with superb build quality and great attention to detail.

Nigel and Kerry both admit that the first ClimbMAX didn't quite perform to expectations. It could be sluggish at times and wasn't as smooth as they hoped. The problem stemmed from not using a large enough centre joint to deal with the new winch design and the added requirements of the blade. To put it simply, the plumbing was not very effective in moving around the 1000 litres of oil in the system to where it was required.

The team made contact with David Aitchison, a professor and doctor of engineering at the University of Canterbury, who has extensive experience with such systems. He redesigned and simplified the

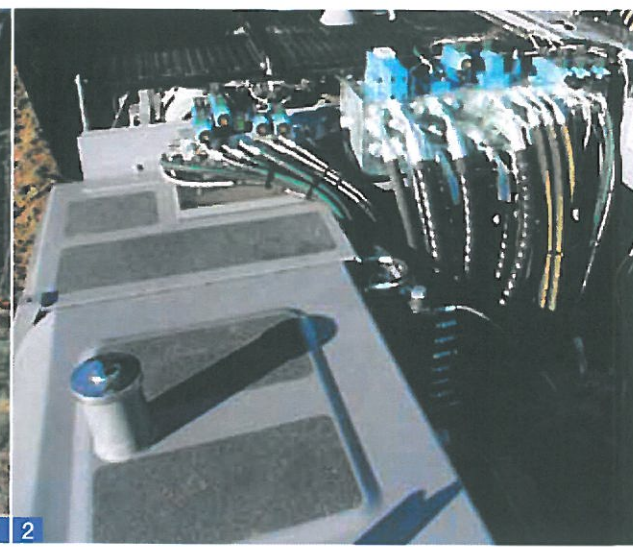


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1. Very happy with the progress of the ClimbiMAX project are, from left, Nigel Kelly and Phil 'Boo' Valk of Kelly Logging with Mark Lindbom and Kerry Hill of Trinder Engineers.

2. Nestled in between the pair of fuel tanks to the left, hydraulic tank behind and the radiator to the right is the all-important hydraulic system that is key to the smooth performance of the ClimbiMAX.

3. The ClimbiMAX emulates an 'All Black' prop forward by keeping its weight down low.

4. More bars have been added to the front screen – the winch and blade monitor is positioned top right.

electronics, which went into ClimbiMAX 2, sold to JB Logging, and all subsequent models.

"The difference was amazing," says Kerry, "and we've improved it with each machine we built, so when you go to move, it's progressive in its starting and its stopping and it has more diagnostics capabilities.

"It's about getting things smoother and how you work the little things. Diagnosing anything is a bit easier and there's a better layout and things are mounted where they are more accessible."

To look at, not a lot has changed on the latest machine compared to ClimbiMAX 1. The big hydraulic oil tank is still positioned at the rear, to act as a partial counterweight – the weight back there is constant, unlike a fuel tank that slowly drains – and it adds 1,500kg of additional counterweight to the rear to keep it in balance. The original 500-litre fuel tank, positioned centre-right under the bonnet, is retained, but has been augmented by a second tank of the same size, giving a total of 1000 litres of diesel.

Kerry also points to some other upgrades that make the latest ClimbiMAX even more user friendly, in answer to a question from Iron Tester Stan Barlow about how the winch works on the hill.

Kerry says: "The whole system is monitoring everything that is going on, all the time. It's checking where the winch drum is, which way it's going in comparison to the pedals. So if you are heading downhill and the system thinks you are in a runaway situation (maybe you've gone onto a really slippery slope and there's no traction, but the winch is spooling out) from about 2.5km/h the system will start putting in resistance to that.

"We don't want the machine moving too fast, at 40-plus tonnes, you need to start slowing it up sooner than later. So at 2.5km/h it will start adding resistance within the hydraulic system. That's where a lot of the refinement has taken place."

Because the winch and tracks use the same hydraulic oils as the rest of the system, we asked what would happen if a couple of the big hoses blew and Kerry says it would quickly sense the loss of pressure and automatically bring the winch brake on in a controlled manner.

And what about that blade? What causes it to be deployed in an emergency situation? The short answer is the blade has to be activated by the operator, so if he senses the need, there is a handy switch to get it down on the deck quickly. Automated emergency blade activation was deemed too risky.

To date, no other 'winch assist' machines that *NZ Logger* is aware of has been designed to use a blade as a safety device. To comply with ACoP, *NZ Logger* understands some 'winch-assist' machines employ a second rope. Others argue that the boom/arm can be used as a secondary safety device. The rule, as you can see, is open to interpretation.

Additional fail safe ideas are built into the ClimbiMAX system. For instance, if the rope gets to the last six wraps on the winch it is programmed to stop, so it cannot run off the end of the drum. The system is simple to re-calibrate if the rope is cut and shortened for any reason.

Which brings us to the reason for the winch and rope being there in the first place. They are there merely to 'assist' the machine to operate on the hill, not to physically hold it at all times, ie they are a traction aid. Mostly, there is little, if any, weight exerted on the rope when it's working. In fact, measurements taken by Associate Professor Rien Visser of the University of Canterbury proved that it only ever spiked to the upper limit once during prolonged testing on ClimbiMAX 1. During our test, the rope was slack for much of the time and little more than three or four tonnes was exerted when it did require traction assistance.

Another issue that is hotly debated is the steepness of hills that 'winch-assist' machines should operate on.

A steep slope is officially recognised as anything over 22-degrees. Theoretically, the ClimbiMAX could operate on slopes up to 50-degrees, but it doesn't. Nigel says they prefer to stay well within safety parameters and won't venture above 45-degrees – still scary.



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Today's test is more of a training exercise than a test of those limits and the steepest Stan Barlow is allowed to go is up to 38-degrees. In fact, when ClimbiMAX operators are under training, they won't actually be allowed to work on slopes tethered by rope until they have amassed 100 hours getting used to the machine on the flat.

Our test is a very special exception and is conducted under very strict supervision, with each step observed, documented and signed off by the ClimbiMAX team.

This newest machine, ClimbiMAX 4, is working with one of three Kelly Logging crews in the Leatham Valley, near Lake Argyle, 25 minutes east of St Arnaud. ClimbiMAX 1 is on a hill on the opposite side of the valley. Where is the prototype, I ask and Nigel says it has just been decommissioned, having served its purpose and will become a backline machine for one of his yarders.

As if to underline the significance of replacing men with saws on the slopes with machines where possible, Nigel's arrival at our test site today was delayed because he was dealing with an incident where one of his fallers in the motor-manual crew was injured the day before. Some manual falling is still necessary, but the reason for developing the ClimbiMAX has been brought vividly home by that incident.

The ClimbiMAX 4 crew, K3, is working in a privately owned block that had been subjected to wind-blow, damaging about 100ha some 14 months ago. This is where 'winch-assist' technology really comes into its own. If there is a place for such machines, it's in wind-blow – the tangle of trees is so dangerous it could never have been harvested safely by men on the ground. Standing on the crest of the hill and surveying the cleared slopes, Nigel proudly proclaims that all of it was recovered with the ClimbiMAX, even some of the nasty little bluffs that no machine has a right to be operating on.

Our test is being conducted in a small area behind the main slope, with a variety of gradients, from easy stuff that can be logged without tethering the machine, to a spur that is estimated to be around 38-degrees.

Kelly Logging's most experienced steep slope harvester operator, Phil 'Boo' Valk, is already clearing part of this area with the machine when we arrive and he shuts down for Stan to get re-acquainted with the cab and controls. We'd already clambered over ClimbiMAX 4 during an earlier trip, when it was being plumbed up and tested, prior to commencing work.

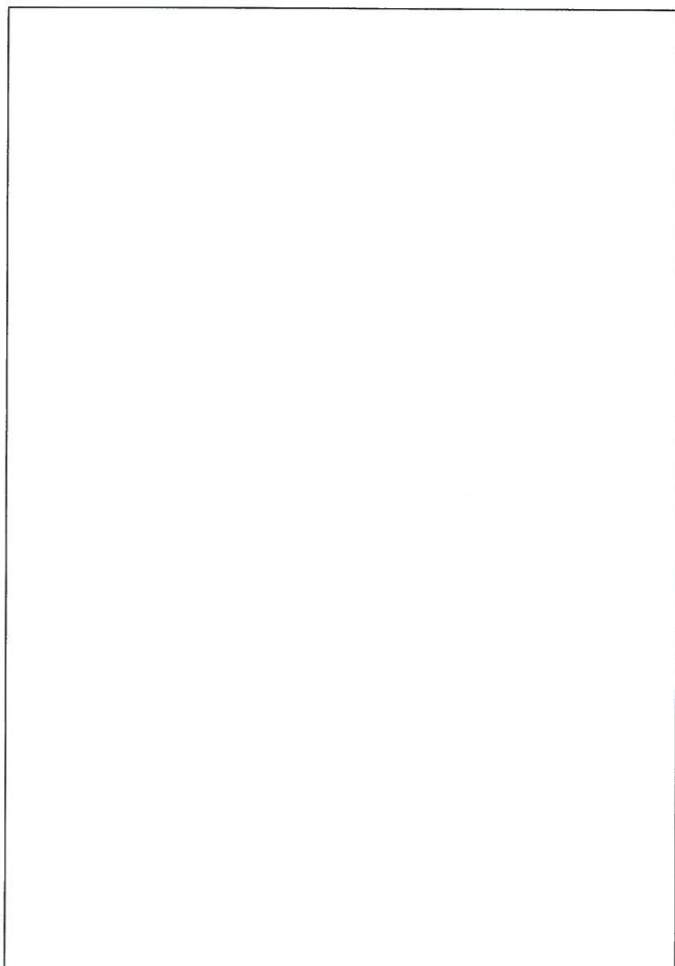
There are detailed changes in the cab from ClimbiMAX 1, some designed around improved safety and others around simplifying and improving the operation. For instance, the simple two bars placed behind the front Marguard screen have been replaced by a more extensive and robust set of bars and cross-members. And the controls to set-up the winch have been brought back from the touch-screen to a toggle lever and switches down by the operator's right hand (the screen is still there in the top right-hand corner but just gives

information now).

I'll leave Stan to explain how the rest of the controls work, except to note that they are set up in the Cat format rather than following the Hitachi slew control pattern (which is really how they should be).

'Boo' and Kerry are taking Stan through the operation of the machine, while I look around the undercarriage, winch and blade.

Although the winch unit is right down in line with the X-frame, there is not much danger of damaging it on a stump, as the high and wide chassis affords 800mm of ground clearance, which is better than most harvesters. The winch itself hasn't changed from ClimbiMAX 1 and is rated to 15-tonnes, in line with the safety limits of the machine and has 380 metres of 7/8ths swage rope. It's a Trinder design and features a traversing winch drum that neatly winds the rope on and off, to prevent any possibility of tangles. Access is through several





# The paper trail



Kerry Hill (left) and Mark Lindbom (centre) of Trinder Engineers, show the paper trail to Iron Tester Stan Barlow.

**ONE OF THE MOST COMPLEX PARTS** OF the ClimbMAX steep slope harvester has probably been the task of proving that it works on paper, just as well as it works in the bush.

It should be the other way around, but a crucial step in the process has been to create a technical paper trail that satisfies a fastidious engineer, before it even satisfies the bureaucrats within WorkSafe NZ, or their counterparts in overseas markets.

Over a cup of tea/coffee, Kerry Hill and Mark Lindbom from Trinder Engineers, took *NZ Logger* through a series of publications they have created to document the engineering thoughts and processes that have gone into the ClimbMAX.

"This is far more extensive and detailed than anything we have been involved with to date – and it has to be, we are dealing with a very advanced concept," says Kerry.

In order to meet the requirements of the ACoP, the project has to be signed off by a professional engineer, which is easier said than done. Not only did the ClimbMAX team have to prove that everything works the way it should, they also needed to prove it is inherently safe in any conceivable situation. To do that, they almost had to reverse engineer the machine.

"Take a particular component that we

designed to work one way and we have tested it and shown it to do that job correctly," explains Kerry. "What we also had to do was ask ourselves if there was a possibility of it not working the way it should and what would be the consequences of that happening."

Multiply that by every newly created piece of engineering and the scope of the project suddenly takes on a whole new dimension.

The project team also had to create a comprehensive operating and training manual that would equally satisfy the engineer and the safety people. It's deliberately conservative, illustrating that ClimbMAX has been designed to a greater specification than needed and this should also put the minds of future buyers and operators at peace that all the bases have been covered. Kerry was also very complementary about the cooperation from CablePrice and Hitachi engineers to make the project work and conform to factory standards to meet warranty requirements.

That approach helped get Nelson Forests on board, who "were great – they didn't put a lot of barriers in front to stop us doing this to allow us to learn as we went," according to Kelly Loggings' Nigel Kelly.

It was also crucial in cementing an export order with the Canadian buyer of the third production machine. <sup>(NZL)</sup>

hatches on the top and sides, so it's easy to get at to lube, change the rope and do any repairs.

Nigel says they've budgeted for two full rope changes per year and he stresses that experience to date has supported his notion that having the winch on the machine itself leads to little wear and tear compared to having the winch on a stationery machine at the top of the hill.

"You're not dragging the rope up and down the hill all the time, which is important, because that rope could be your lifeline," he adds.

The blade, also designed and built by Trinder, was primarily introduced on the ClimbMAX series as a safety device, but it's become an invaluable piece of kit in the Kelly Logging operations. 'Boo' is using it to clean up the tracks for the skidder to come in and drag out trees.

In the two-and a-half years since the first ClimbMAX went into operation, the blade has never been used in an emergency but it has been tested and will actually drop to the ground in less than a second when activated by the thumb switch on the right-hand control lever. However, it is being used to stabilise the machine on some slopes, where 'Boo' brings it down to the ground to firmly anchor the ClimbMAX in a fixed position. He can even raise the rear of the machine a few degrees so that it's not leaning at such an angle.

This brings me to another issue that is still being debated by contractors who are going down the 'winch-assist' path in their own way or considering it – is a levelling machine better than a non-leveller on the slopes for the comfort of the driver.

Naturally, the ClimbMAX team say they are happy with a conventional base and they do make some interesting points. Firstly, their machine has been designed with a much lower centre of gravity and, from experience, it can be very disconcerting being up so high from the ground when operating a leveller on a slope. Secondly, a conventional machine is actually swinging at the same angle as the slope, whereas a leveller is slewing into the ground on the uphill side. Thirdly, the best of the levellers can still only tilt



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to about 26-degrees, so on anything steeper they are still on a lean.

'Boo' has been strapped into the 4-point harness inside these machines for the past five years, spending up to eight hours a day working on acute angles and he quickly got used to it.

"I did feel a bit uncomfortable to start with, but I am fine now and don't even think about it," he says.

"I've also operated the John Deere 959 levelling cab machine on steep slopes and you are still on a lean, so I prefer the flat bottom on ClimbMAX."

Stan is about to get his opportunity to put that opinion to test, having spent 45 minutes undergoing his in-cab induction lesson, on top of the breakfast session earlier in the day, when we studied the manuals and operating guides. He should be used to it, having produced safety manuals of his own and spent recent years assessing crews as part of Top Spot and through his own training business, but he admits to feeling a little overwhelmed.

So he starts in an un-tethered area, getting used to the way the Trinder felling head works and adjusting to the feel of the controls. One of the advantages of this felling head is the movable saw box, which can be swung out of the way when shovelling and bunching. The increased tilting also means the felling head doesn't hit on the stops easily, so the operator can hold onto the tree as it topples and hits the ground. This gives him more control and increases the safety margin when felling trees on slopes. This is especially beneficial when felling on steeper country as bunching becomes more difficult.

Stan likes the way it works, but has to

remember to pull the box out of the way and says it takes a little getting used to. He's also not very familiar with latest design felling heads, having learned his trade on a Timbco with an old feller/bunching head back in the day.

It's a lot to learn in such a short time, but once he is comfortable with felling, shovelling and bunching, plus a little bit of blade use, it's time for the second part of the lesson.

The ClimbMAX is brought to the top of the ridge and enough rope is spooled out to run over to a stump, where 'Boo' and Nigel take Stan through the process of not only attaching the strop to a stump, but also setting up the tension monitor that signals to the operator if there is movement in the anchor. This is an improvement on the tension monitor I first saw in 2010, being lighter and yet more robust – it's also more reliable, adds Kerry.

Once again, Stan has to go through an induction process on the use of the winch and tension monitor before the boxes in the operation manual can be ticked and signed off. And it's not signed off until he shows that he does fully understand it.

Then he gingerly reverses down the slope and approaches his first tree. He doesn't have to worry about paying rope out from the winch, as this is done automatically and very precisely. All Stan needs to concentrate on is driving the machine and positioning himself to cut down the trees.

This is his first experience on a fairly steep angle – around 35-to-38-degrees – and through radio contact he is asked if he feels comfortable enough to continue with the next stage of the test. He is. But he still sounds nervous. And who wouldn't be nervous, when you are in charge of \$1.2million worth of

state-of-the-art harvesting equipment in this somewhat precarious position?

The ClimbMAX doesn't miss a beat, though. There is no hint of instability or any threat of slipping down the hill. The rope is laying on the ground, with little tension being applied. It's not going anywhere except to the tree where Stan is guiding it.

For the next while, Stan brings down a handful of trees and tries to get more comfortable, but it is clear he hasn't quite mastered the machine, so he is called back up the slope and Nigel talks him through some finer points. The pep-talk worked. No sooner is Stan back down the slope he is felling trees with more confidence and is disappointed when we eventually have to call time on the Iron Test so we can catch our plane out of Nelson.

Beaming as he jumps out of the cab, Stan endorses the comments from 'Boo' about how stable the machine is on the slope and he says it also feels more under control when climbing or even descending slopes, with the rope not only aiding traction, but also preventing the ClimbMAX from rocking fore and aft. And he also feels more at home working on an angle than when he started off in the morning.

It's been a very enlightening test and has lived up to our expectations in a number of ways, underlining the confidence shown by the ClimbMAX consortium, even faced with criticism from others for producing a machine considered by a few people to be too expensive. But is it?

I've heard anecdotal evidence that some of the other 'winch-assist' set-ups that were supposed to have cost much less, have ended up running way over budget and may well



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# SPECIFICATIONS

## CLIMBMAX TRACKED HARVESTER

### ENGINE

6-cylinder, 7.79-litre, Isuzu AH-6HK-1XYS-A-01 common rail diesel, Tier III, turbocharged & after-cooled, dry sump	
Bore / stroke	115mm x 125mm
Net power, SAE	202kW (271hp) @ 1,900rpm
Torque	1,080Nm @ 1,900rpm
Max travel speed	5.5km/h

### HYDRAULICS

Main pumps	2 x variable displacement piston type
Max flow	288L/min
Swing speed	10.7rpm

### BOOM/ARM

Model	Trinder
Max reach	10m

### FELLING HEAD

Model	Trinder TFH1600 with retractable saw box.
Max. opening	1580mm
Max. cut	1000mm

Saw	43" bar with 3/4" chain
Weight	2400kg including hanger

### REFILL CAPACITIES (LITRES)

Fuel tank	1000L (there is only one to fill as they are interconnected)
Coolant	35L
Engine dry sump tank	45L
Hydraulic system (inc tank)	1000L

### DIMENSIONS (MM)

Transport length	9,770
Transport width with shoes	3,500
Transport height	3,940
Tail swing radius	3,590
Ground clearance	800
Track length	4,640
Track shoe width	600 with single grousers
Operating weight	41,920kg

pricier than the purpose-built ClimbMAX. Then you've got to factor in that you have to move two machines from site-to-site, not one, plus the expense of maintaining and repairing two machines.

And then there's the question of productivity, which I have left until last, since the main reason behind the 'winch-assist' concept is safety. But if you cannot get that machine to pay its way, what is the point?

Back in 2010, Nigel estimated that he could make 40% improvements in productivity based on how effective the prototype was, against traditional motor-manual methods.

"Those numbers haven't really changed," says Nigel. "There are times when it's more than 40% and it can even double our production and then we come into a place like this and you're just fire-fighting.

"Once we've finished with this wind-blow it will be nice to get amongst good, standing trees and pull some decent numbers. We want to improve how we can lay the wood out and present it more for the haulers and the breaker outs – that's the next step.

"As far as the ClimbMAX itself is

concerned, we are very happy with where we are at. We've completed the design stage and we're now ready to take it to the market.


"When I look back to the prototype and now where we are at with ClimbMAX 4, we've come a long way. We went into this thinking we'll spend a bit of money to put on a winch and see how it goes. That first machine gave us a good start on what we wanted to do and we've been able to re-design it and make it work much, much better. It's been a huge team effort and I have to acknowledge the contribution by Mark from Trinder Engineers, Gary from Fluid Power Solutions, Shawn from Tasman Auto Electrics and the guys from Rzoska Electrical who are looking after the electronics now, they've all done a great job. And we also want to acknowledge the assistance we got early on in the project through the government's PGP Fund with Future Forest Research, which was very welcome."

"ClimbMAX 1 was twice as good as the prototype. And now to ClimbMAX 4, from an operator's point of view, it's probably twice as easy to operate. It's not twice

as productive, but from the comfort side and the usability it is very, very good. With designed-out changes that have been made I am sure we will have less maintenance as well, so I am very confident with the product."

That confidence got a major boost when Nigel and his wife Kellie flew to British Columbia to see the third ClimbMAX go to work in a foreign forest. The Canadian machine continues to impress, having been through a harsh winter, where temperatures dropped as low as minus-25 degrees and they were still able to harvest safely on steep slopes that would otherwise have been unattainable.

"It was a fantastic feeling to see our machine operating in Canada," says Nigel. "It put a different perspective on where we sit, and maybe it shows that we are punching above our weight internationally, but we still live in hope of building more machines for our local market."

ClimbMAX 5 is well advanced in the Trinder workshop and just a few months away from being ready for a new owner. 



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0800 4 SHAWS



# CLIMBMAX IS A REAL LIVE WIRE



Iron Tester Stan Barlow.

**WHEN YOU STRAP YOURSELF INTO A** 4-point harness, instead of a lap belt, it suddenly brings home how different this machine really is.....and yet, it all feels so familiar.

The controls are pretty much the same as any other digger (nice to see they use the Cat pattern), the view is similar and it performs the same job as any other harvester.

The big difference is that you can work on slopes much steeper than you dared to go without the safety of the wire rope attached to a stump up the hill. It just takes a bit of getting used to.

I admit I had a big dose of nerves coming into this Iron Test. I really didn't know what to expect and I was worried about breaking something expensive (I did snap a chain on the felling head saw, but that was all).

There is no barrier to what the ClimbMAX can do on slopes up to 45-degrees. The real barrier is a mental one and I didn't have the usual 100 hours of training time to get my head around it. Very grateful to Nigel, Kerry and 'Boo' for being so patient with me.

My previous experience with a harvester on this sort of terrain was a Timbco leveller with a feller/buncher head – I've not used a grapple-type felling head before, and it showed. I spent the first part of the Iron Test getting used to the way it worked and remembering to retract the sawbox when I'd finished falling and started shovelling. But once I got it, the Trinder head worked a treat and I can see lots of advantages over a standard felling head.

Thankfully, the ClimbMAX is simplicity itself to operate and it was good to get time on a mild slope first to see how it answered the controls and get comfortable being held tight against the seat.

The big difference to a standard machine

is the winch. I had a long induction session with Kerry and 'Boo' and while there is a lot to learn, we did skip the diagnostics part, as it would only be relevant to someone operating the ClimbMAX full time.

We covered the winch and its braking system and how to change the brake weight, which is pretty simple really, using the toggle stick down on your right and scrolling through on the display screen. 'Boo' suggested a 3-tonne brake weight, which he says is standard for this machine and most of the slopes – so it will put more resistance in when the weight on the rope is above that limit. You can go up to 15 tonnes, for when it's on very steep land and handling lots of heavy wood.

Attaching the rope to a stump and then setting up the tension monitor is very straight forward. And then it's back into the cab, lift the blade and reverse down a much steeper gradient than before (the angle is shown on the monitor, but I never looked) and start getting used to felling trees on a real lean.

This is where you need to remember the training. In addition to the boom up/down and open/close grapple operations on the right-hand joystick, you've got a button to make the winch go into maximum pull mode when you need a bit more assistance going up the hill. It made a big difference when the tracks were slipping on a rocky outcrop, but it also made steering more difficult so it pays to use this feature only when necessary. Otherwise, leave it in auto and let it wind in or pay out the rope with little resistance, as you move up and down the hill. It does feel a little weird at first, but the big benefit is that the rope stops the ClimbMAX from rocking over the ground and it feels a lot more stable than any machine I've operated on slopes before.

There is also a button for the blade on

the right joystick, should you need to lower it onto the ground for a more stable felling platform, but I didn't need to use it – the open and close function lifts it up and down.

The left joy stick has the usual dipper arm and slew left/right functions, and the buttons are for harvester up, saw box retract, rotate left and right and a trigger to activate the saw. There's also another button that pulses the head up into different positions, which I found very useful, especially dealing with a couple of wind-blown trees at the bottom of the gully, because you could get the head into position very easily.

There's good reach with the extended boom/arm and the slew power is great for pulling the wind-blown tree roots out of the ground. It never changes, no matter what angle the machine is on and I can see why these guys are happy not to have a levelling base – you don't have to think about lifting the boom and arm up or pushing it down in relation to the ground.

You don't really need to think much at all. It just works. Nigel told me he wanted a machine that is simple to operate and that's what he's got.

I never gave much thought to the fact I was working on a steep angle at all once I got on with the job. And 'Boo' says working long stretches on the hill doesn't affect him. The only downside I could see was the limited movement from being strapped in tightly to the seat, which makes it impossible to lean forward to get a better view or to look over your shoulder. You learn to slew the machine to get around that.

I was finally feeling at home when the radio call came in to bring the machine back up the hill. Damn shame. I really wanted to see what more it could do. (NZL)