Transcript of the stubble, straw and carbon – panels, pellets and alternative uses webinar

Heather Field:

Okay, our webinar today is on Stubble, Straw and Carbon, Panels, pellets and alternative uses. In this webinar we will hear from three speakers. First up we will hear from Graeme Anderson from Agriculture Victoria, who will speak on the benefits of putting stubbles into building products to capture carbon for the long term. We'll then hear from Steve Layfield from Ortech Industries, who will share how they are contributing to positive carbon farming by using straw, stubbles in building products, which would otherwise be burned after harvest, contributing to carbon emissions, and then Ray Davies, Pyrenees Shire Council will discuss how local farmers are converting stubbles and straw to energy as one means of alleviating the need to burn stubbles in Autumn and Ray will also share a pilot project with the Skipton Hospital.

Heather Field:

So we've had a lot of interest in today's webinar with about 130 people registering, which is terrific, and we've got a number of you online live today. So first up, we've got Graeme Anderson from Agriculture Victoria and most of you would know Graeme. Graeme is an experienced science communicator and extension leader with Victoria's agriculture sector and he leads a small team who deliver climate risk services, which assist farmers and advisors in making sense of emerging issues and how to adapt their local farm systems. So over to you, Graeme. Your slides.

Graeme Anderson:

Thank you. Thanks Heather and welcome presenters and welcome everyone out there. Thanks for joining us today. Really good chance to talk a little bit about stubble and straw and carbon and productive uses for it. We've got a great bunch of talks and plenty of room for questions after the slides. So thanks Heather, I'll go to the next slide. I guess just setting the context, one of the key things is that most farmers aim to retain their stubble, and there's been a fantastic amount of work done with conservation tillage and working right across the grains industry for maintaining profitable systems, which retain stubble. We know there's been a lot of research done about stubble retention, it's got really well documented benefits for nutrient recycling and reducing erosion, keeping ground cover, improved rainfall infiltration, reduced moisture evaporation, all sorts of good stuff.

Graeme Anderson:

So across Australia and in most seasons, levels of stubble growth and production and retention varies a bit but also in some seasons, and we're coming up a pretty high yielding season last year, especially in some of the high rainfall zones and medium rainfall zones, some farmers can have the issue of having too much stubble. So what to do with it? The question is, can we put it to more productive uses that drive a lot of economic development? Next slide thanks Heather. So I just wanted to context that and for anyone that's looking for all the great work that has already been done around stubble retention and all the good things it does, there's a great amount of work that's been done by GRDC and their partners, so head to that Stubble Initiative site. Some really good resources there. Next slide thanks Heather.

Graeme Anderson:

And there's lots of work that's been done around the various phases of the season when it comes to, how do you manage stubble and stubble loads post-harvest through the preparation phase or dealing with seeding, when we're dealing with larger stubbles? Also the agronomy issues of disease and pest management and also different approaches to how its dealt with stubble in the harvest side of things. All of that is really good work that's been done and the next slide thanks Heather. Just pointing that if you're seeking some of that information, there's been some really good work done. Again, partnership with GRDC and a local farming systems group.

Graeme Anderson:

So if people are after some of that really good agronomy management work on stubble management, please head to that website. Each farming group's basically worked to have a local stubble management guide and there's lots of good stuff there. Just thought I'd do that first and then we'd get into the next bit, thank you. But in some years, we do have too much stubble and then the issue is, we do occasionally see it being burned but there's also lots of really productive things that are being done with stubble not just here in Australia but also overseas. There are export markets for straw. There's markets for straw in bedding in lots of animal industries. There's pelleting stuff, which is used for energy or it's used for just making it better to handle for things like other industries such as kitty litter and all of that stuff, and there's lots of different building types of products that can be made from straw.

Graeme Anderson:

So today is a great opportunity just to hear from a couple of people who are doing fantastic work, just trying to look at, how can we use some of this excess stubble and put it to good use. Next slide thanks Heather. Also I just want to point out, there's obviously a lot of discussion at the moment around moving towards low carbon, zero carbon economies and the potential opportunity that sits here with more productive uses of straw. I've just got a little example here, a bit of an image about the positive carbon story that comes with sustainable use of either forests or crop stubble. If you imagine, we can start with... most people are familiar with the forest, for example, where if you go out and plant a tree, that tree will grow and it will take in carbon dioxide from the atmosphere and it'll put it into the wood and basically, as we know, if you harvest some of that wood and the wood then gets used in building products, you've got some carbon that was in the atmosphere a few years earlier is now actually sitting there in housing floor or in some furniture or something.

Graeme Anderson:

So you've taken carbon out of the atmosphere and put it to work as well as putting it to good use. Of course also, with some of those trees, when you do harvest, you might have residual residues and waste and some of that can be converted for energy and then that carbon's then released back to the atmosphere, but even if you just grew the tree and you burn it for firewood, you're basically turning over carbon that you've taken in to begin with, so essentially with this biomass story, you have what's close to a carbon neutral cycle. You're dealing with carbon that you've brought down to the Earth out of the atmosphere and then you're putting it to other uses and if it goes back in the atmosphere, then you're re-taking it up with re-growing that forest again. So I want to move to the example of now if you do that with straw, that we grow straw, it's part of our cropping systems.

Graeme Anderson:

Largely that straw is retained. It does decompose after a year or two and ends up back into the atmosphere. That's all good and that's a sort of a carbon neutral cycle, replaces itself but if you take some of that straw in some years and you put it down into the bottom right corner and to building products, you've actually taken some carbon out of the atmosphere. You've taken that straw, put it in a building product and then that carbon will sit in a house as locked up carbon for the life of those buildings. So you've actually created a net positive flow of carbon out of the atmosphere into building products and also, even if some of that, you've got some waste and you do happen to burn that, such as for heat energy, yes that carbon is released but then your straw in the crop next to you will just take that back and use it again. The key bit here is that if you're using those straw pallets to provide heating or energy and it's displacing a non-renewable fossil fuel, you've actually created quite an important carbon gain in that process.

Graeme Anderson:

So while the turnover of straw might be carbon neutral, if you're using it for some energy production, you're actually displacing fossil fuel, so there are different uses for heat energy, especially across rural Australia where this could potentially play a role. So that's what we're going to hear about today, is some examples of people doing productive things with straw. Yes, it's quite a positive carbon story. You've also got lots of other great benefits, potentially, if in the next 20 years we can see more of this happening across rural Australia because straw is produced in a much wider area of the country than just forestry. Often a lot of forestry's in the higher rainfall zones but as we know, straw can be grown wherever we've got a grains industry.

Graeme Anderson:

It also potentially offers some income streams for some use with that excess straw, which is a good thing, but also offers a lot of employment opportunities and then the end for consumers, there's some pretty low carbon or positive carbon products potentially on the market. So today's really just flagging that and I'll finish there and we'll go to some people who are really doing some interesting stuff. Thanks Heather.

Heather Field:

Great. Thanks for that, Graeme. That was a good introduction and setting the scene for our next two speakers and always a good reminder there about the carbon cycle and I've popped that Stubble Initiative, GRDC link into the chat box for everyone, if you would like to click on that at your leisure. Okay, so we're heading over next to Steve. Just setting you up, Steve. So while we're getting Steve's slides up on the screen, Steve Layfield is from Ortech Industries and he's a technical sales representative and so today, we'll be looking forward to hearing from Steve on their sustainable building materials using straw stubbles.

Steve Layfield:

Yeah, thanks for that Heather. Just before I bring up the slides, I'll just run through and I brought some of the product in here as well just to show what it is physically. We have a pretty neat sample here but definitely I just wanted to say first thanks to Graeme and Heather for thinking of us. It's great to have a bit of an opportunity to talk about what we do and we've just found over the past two, three years that our company ended up building products just growing by popularity as the industry's changing building materials. We manufacture Durra Panel and I took a sample in here. You can actually see the cross grain, hopefully, depending on the lighting in here but it's actually straw stubble that is bound with heat and pressure to form this panel core. It's wrapped in a recycled craft paper liner and then we can add material finishes on the face of it as well and we export that all over the world. I'll start off with the presentation here. Just bear with me a sec. So good then Heather?

Heather Field:

Yes, that's great, thanks Steve.

Steve Layfield:

Perfect. So the history on Durra Panel, some of you may be aware that this product has actually been around for a very long time but it actually originated from Sweden, when it actually went to England before it came to Australia. It was brought over just after World War II when there was a shortage of building materials in Australia, in 1954. So we had, it was called Stramit Board back then. They set up the manufacturing plant in Bendigo, Victoria because that was the heart of the wheat belt and basically, that panel system ended up in a lot of houses throughout the '60s and '70s, used by very affluent architects as well with their flat roof designs, flat roof designs when they were all the rage back in the '70s and '80s. It's funny how that sort of teed it off in the '80s but now it's come full circle again and those sort of house designs are becoming popular once more, hence our product is getting back in the industry in the residential market.

Steve Layfield:

Over those years since 1954. It became Ortech Industries in 1980. We're predominantly focused on commercial applications. Durra Panel's specified for projects such as Melbourne Convention Center, airports across Australia, convention centers in New Zealand all the way to manufacturing facilities in Italy, Greece, Poland, everywhere. It's amazing where some of that stubble that is harvested in that wheat belt, it just ended up everywhere across the globe. A bit about the farming and bailing and purchasing.

Steve Layfield:

So obviously, being in the wheat belt, we source a lot of our stubble from Elmore and those sort of regions around there, usually sourced with 100 KM radius from our factory. The straw could be any sort of variety nowadays with our manufacturing, we've really honed in onto just any variety but generally it's Scout in those regions that we use. Basically, the straw contractor will just come in and bail up those bails and then we'd purchase that from the farmer, so it's great to provide another secondary source of income for them, where we can turn that into a building panel.

Steve Layfield:

There's a few slides here, the manufacturing process, which is a really great thing. It's a very clean process. Basically the bails are loaded up onto our conveyor belt. They're teased and broken up into loose straw and then run across another conveyor belt, which we call the vibrator and then down the hopper and then in between two heated plates where extreme heat and pressure is applied to form that panel core. So what actually happens is there's no glues or binders used in the manufacturing process. It's actually ligands in the straw that is extracted, helping bind that core together. The really good thing about this is it gives us great thermal mass, gives it very good acoustic properties and it gives us a very dense board.

Steve Layfield:

So in the building industry, why we do a lot of convention centers, airports, things like that, is that it is just naturally a very good acoustic panel. For some reason, it just handles low frequency noise right up to high frequency noise better than three layers of plasterboard. So that has been the main driver of our business for a very long time. Talking from what Graeme was saying, obviously the carbon impact is a big ticket item for a lot of people and architects and building designers nowadays. Everybody is trying to look at things in buildings, designing them with the end in mind.

Steve Layfield:

A great story that I've had for a long time is when we supplied our partition wall system for the Sydney Olympics, the green Olympics. We had over two kilometers of Durra Panel manufactured for that. They set it up in the media center there for the Olympics and basically, at the end of that, they put the panels through a mulcher and spread them over the gardens in Sydney, which really does show that true lifecycle of our panel. We've calculated roughly 31 kilograms of carbon dioxide is extracted from the atmosphere and 8.5 of that is stored as carbon within the panel.

Steve Layfield:

Another fact that we say, in that bottom picture there in the bottom left hand corner is some of our housing. Auto industries also produce modular buildings using Durra Panel in the walls and ceilings and we do a lot of work with Kids Under Cover, Anglicare, a lot of affordable housing and social housing industries where we have over 900 of these in the field. There's a great little note there where it takes seven acres of straw to build a standard three bedroom house that's renewable every year. Compare that to half an acre of 44 trees, the same job but it grows every 30 years. It's a really good comparison there to our building products versus conventional.

Steve Layfield:

From the project applications, we can see here just as a bit of an example, it's basically just a few, we've got Casey Fields, AFLW, that new pavilion where they've just got our natural finish Durra Panel in the ceiling there. Melbourne Convention Center, there's thousands of square meters of our product there, right to residential and Wonthaggi Desalination Plant too where that was a very high acoustic criteria that we had to meet. So that was a really good product to have.

Steve Layfield:

The other things that we achieve with our product and what we get specified for is fire resistance as well. Being such a densely compressed straw product, it actually doesn't burn. It actually carbonizes. Similarly like burning a phone book. You can hold a blowtorch to the face of a Durra Panel and just watch it carbonize on the surface. Basically it self-extinguishes, it doesn't get any heat transfer through the panel and you can scrape away the carbon and still see that golden straw right behind it. That is another really cool characteristic about it. Basically that's what we do in a bit of a nutshell at Durra Panel. I think that's pretty much it for me. Heather, I'll leave it to the questions after this.

Heather Field:

Great. Thanks Steve. Yeah, very impressive projects there. I did take away that seven acres of straw to build a house and that straw regrowing in a year, so that's pretty great statistics for that. So thanks for that, Steve, and yes, if you do have questions for Steve, pop those in the chat and we'll get to those later in our webinar. So I will now hand over to Ray and I'll just give Ray control so he can pop up his slides. Ray is representing the Central Highlands Straw Alliance and has also been the manager for economic develop and tourism at the Pyrenees Shire for the past 12 years and much of Ray's role is focused on infrastructure that supports the sheep, beef cattle and grains and wine manufacturing sectors. Since 2017, Ray has been working with a group of nine farmers who are considering bioenergy and potential markets for their stubble straw. So we will now hear of another great example of how local farmers are converting straw to energy. So we'll just get your slides up, Ray.

Ray Davies:

Thanks Heather. I'm just looking for the right file here to see where I'm at with these. I won't be a second. Can you see that, Heather?

Heather Field:

Not yet.

Ray Davies:

Right, okay.

Heather Field:

I can put them up at my end, if you like. Here they come.

Ray Davies:

Yeah. All right, I'll just put that into slideshow. Now back to the start. First want to thank Heather and Graeme for the opportunity to talk to us today. Council was approached back in 2016 by a group of farmers nearby to Beaufort, looking at alternatives for straw to the traditional Autumn burning regime that's been in place. That group consisted of nine farmers at the time. We've had a couple more join more recently. The group crop about 14,000 hectares and produce about 50,000 tons of straw annually and so we looked at a range of options but of particular interest to the group was bioenergy and I'll come to that in our presentation shortly. Obviously burning is not the most acceptable practice in terms of it being a dirty and sometimes dangerous thing, where controlled burns can become uncontrolled and require reaction by local fire brigades, many of which are volunteer farmers themselves. So the things the group were keen to look at initially was to establish a straw pallet manufacturing facility that might be a supplier for a bioenergy market yet to be established and we initially had the support of Regional Development Victoria with some Food Source Victoria funding.

Ray Davies:

That enabled us to conduct a feasibility study and business case for that particular project. The slide I've got up at the moment is probably a pretty familiar one to most watching today. It represents, according to the farmers that provided this snap to me, around about 150 tons of biomass that are burned within a couple of hours on an afternoon. Just to put that into context, we're currently doing a pilot project where straw pellets will be use to substitute LPG. That's currently the heating fuel for hydronic heating and hot water service at the Skipton Hospital. We estimate that the straw pellet replacement will be about 200 tons. So that cloud there represents about nine months’ worth of energy based on those figures.

Ray Davies:

One of the things we looked at was, what are the options for large straw bales? We did some analysis on what the lowest cost would be to produce a straw bale and examined markets for that, including biomass but also things like the potential for using things like mushroom industry straw for bedding and intensive animal and those sorts of opportunities, as well as another thing that we investigated was the development of straw pellets. The original business case that we looked at was a standalone factory type facility and during out investigations and examination of that, we became aware that Krone were developing this piece of equipment, the Krone Premos 5000, which is as you can see, an in-paddock pellet manufacturing machine, drawn by a tractor of somewhere between 350 to 500 horsepower.

Ray Davies:

So this is a piece of equipment that's been trialed by our group locally in the last couple of seasons and was operational up until a couple of weeks ago, producing pellets that will supply the Skipton Hospital in the not too distant future. The next slide here is simply a visual of what those pellets look like. They're about 16 ml in diameter and a variable length. So we started our relationship with Beaufort and Skipton Health Services back in about 2012 and the facility you can see on the current slide is actually a wood chip operation that was commissioned in April 2014. The fuel supply of those wood chips comes from a sawmill located only about a 10 minutes’ drive from Beaufort. The story being, how can we localize energy suppliers and provide greater opportunities for people within the region as opposed to energy supplies going off to multinational companies where the local community doesn't necessarily see a greater benefit out of local energy supply solutions. The facility you can see there has been operating satisfactorily for about seven years and the hospital recently told me that they've saved a significant amount of energy through the use of that facility in Beaufort.

Ray Davies:

So we re-engaged with them again, after we started work with the straw group and looked at a business case that examined energy supplies not only for their thermal demands, for the hydronic heating and hot water but in this case, the potential for an electricity supply and two systems, one being a steam combined heat and power system and the other one, gasification technology, were factored into that business case and then thirdly, we had a heat only system, ideally using straw pellets for simplicity at the hospital, for transport and storage and logistical simplicity rather than having the hospital having to handle large bales going into a system.

Ray Davies:

So the hospital board selected the heat only system. It was the simplest way forward. The project was subsequently funded by the Victorian government through its Renewable Communities program and the slide there illustrates, and at the procurement phase, it's actually the construction phase now and I'll show you a slide of that construction shortly but ultimately the straw group will be entering into a straw supply arrangement with the hospital service as part of this pilot project.

Ray Davies:

So this is work in play at the moment. A photo of the site on the 12th of this month. There's currently a roof going over the containers this week. Boilers are inside those containers that are currently being worked on at present that they commissioned and sort of in the foreground on the right hand side of the shop there, you can see where the hopper is for receiving the pellets upon delivery and a ladder leaning against the belt elevator system that will take the straw pellets into the storage container at the back of the boilers. We're affecting the facility to be commissioned somewhere towards the end of May at this stage of the game.

Ray Davies:

So just quickly, a quick recap on the benefits that we see. I won't read this word for word. I think, Heather, the slides from today will be made available to the participants but just quickly on the benefits that we see are, we're creating a new, renewable energy source that displaces fossil fuels, in this case, LPG's being used to make the thermal demands for hydronic heating and hot water at the hospital. It's a pilot project that can be replicated, particularly at other hospitals where they're located in wheat belt areas that may not be connected to natural gas and in particular, those that are reliant on LPG.

Ray Davies:

There's the potential to develop a new industry out of this because the technology that is being installed at Skipton is imported equipment from Europe, Czechoslovakia is the location where the boiler systems are manufactured at present but this is a potential manufacturing opportunity for Australia once the technology becomes more familiar within this country. So the other large benefit is that the dollars spent on the energy bill of the hospital remain within the local community. A local farmer will be providing that supply, they're using a local contractor to transport the materials to the hospital, so that's two businesses that will derive some sort of income locally as a result of the replacement of the LPG system.

Ray Davies:

Finally, it comes back to the ability of farmers, once this type of technology is more broadly adapted, an alternative to burning so that materials can be taken from the paddock and used as a fuel source for this type of project and other potential opportunities that also are being invested by our group, that would look like or comprise what we would call back of the meter type combined heat and power technology that could be a potential electricity source for manufacturers in rural and regional Victoria. That's under further investigation by the group at present, as well as the opportunities for biogas systems where gasses can be captured off straw combined with other green materials such as food waste and organic materials.

Ray Davies:

So there's some of the things we are looking at at the moment in addition to delivering the pilot project at Skipton. Just finally is a quick slide. This one is a containerized gasification system that would generate electricity, pre-packaged in a shipping container that could be a module system easily delivered at a location where there was a requirement for energy. That's where I'll leave things for the group to make some questions. Thanks Heather.

Heather Field:

Great, thanks for that Ray. Another great example of sustainably using stubble straw for bioenergy so thank you for sharing that and the benefits of converting straw to energy. So we now have some time for some discussion and questions. So if you do have a question for one of our three presenters, please start putting that into the chat box and we'll get to those questions. While we wait for those questions, Graeme, you have a couple of questions for both Steve and Ray to get us started.

Graeme Anderson:

Yeah, I do. I mean, great presentations, thanks Ray and Steve and congrats on the great work you're doing. To me, they're quite exciting about, these are earlier days but the potential for both of these to really grow over the decades as we're looking for local development, rural development and sustainable local energy and production. That's a good story. One you've probably come across, Ray, some people get a bit concerned, sometimes we're burning stuff but have you got any comment on how you reply to the emissions standards for burning? Of a controlled device compared to perhaps the smoke from a paddock? Any comments there?

Ray Davies:

Yeah, the emissions from these systems or the technologies developed for European standards, which would easily make Australian equivalents in this country. The amount of output falls below EPA triggers in the case of the Skipton pilot project but what we all see when Skipton's commissioned that I would expect would be very similar to that at Beaufort, where the wood chip facility, you cannot see smoke from the chimney when it's operating and if you think about it a little bit like a car that's running well, you won't see puffs of smoke coming out of the exhaust pipe but if you do start seeing smoke, you've got a problem there somewhere that needs to be rectified and that might be moisture in the fuel or something of that nature. Ideally, when the system's operating well and the wood chips at Beaufort are delivered at a certain moisture level within the supply arrangements and when the politicians arrived to do the official launch of that facility a few years back now, they asked that very question, "Where's the smoke come from?" And when I pointed to the chimney stack, they were quite amazed that there was nothing really visible in terms of puffs of black smoke coming out.

Graeme Anderson:

No, that's right. I guess that's the point, isn't it? This is a highly technical, high tech device, that's burning at not the old incinerators from the '70s. That's great work. We've got some good questions coming in and I've got some more questions too, Heather. It's great, we've got Colin Peace, obviously, online today. He knows a fair bit about straw too so welcome Colin. There's a question there from Colin for Ray, "How are the pellet costs looking these days?"

Ray Davies:

Yeah, the business case was based on an assessment from memory of around about $110 per ton. There's a little bit of fine tuning with the technology that's producing the pellet and there's probably still a little bit of a give and take in those numbers at this stage.

Graeme Anderson:

Yeah, thanks Ray. I guess that machine, you've had it operating... I mean it's amazing to think that's an in-paddock machine and it does look to go pretty slow though. For farmers who like to go pretty quick through the paddock, this is now one of those machines, is it, Ray?

Ray Davies:

No, that's probably one of the drawbacks. You're looking at throughput of somewhere around five tons per hour. With grain, I'm sure, that they're keeping a close eye on the further development of the machine to make sure that it's going to be operating satisfactorily for all concerned.

Graeme Anderson:

That's great. Thank you. Just one from Colin to you again, Ray, and then we've got a few questions for Steve. So get ready Steve. Ray, Colin's just saying, "It's a great year to promote these systems as straw prices are low and appear to be safe for the foreseeable future. Have you seen much in home heating with pellets as they do in New Zealand?"

Ray Davies:

We haven't examined home heating with this group at this point in time. Our focus has been more on getting a hospital system up and running to a point where it can be replicated at other rural hospitals and there's a fair bit of interest by those in the southwest, nearby to Skipton, as to what's going on with this pilot and yeah, pretty close scrutiny, particular if LPG is their only energy source for thermal needs.

Graeme Anderson:

Fantastic, Ray, and congrats again because you've been innovating out there in your work with the farmers and the potential is for hundreds of these across rural Australia but someone's got to start and it's always more expensive and more challenging when someone's trying to prove it the first time. So well done. Steve, a few questions for you popping up. One was just, "In the process of the straw, what sort of straw do you use?" Is it wheat or is it barley? Oats? Can you use anything? Then, "Is particular lengths in bailing that's needed?" I imagine it's not just any straw will do.

Steve Layfield:

It's pretty versatile, like I mentioned before, we've fine-tuned our machinery now, like the sheer blades that actually cut the straw between the... jam it between the two heated plates. We're actually able to use quite a large variety of straw. We do mainly use wheat straw, however we can also switch to rice straw as well. In fact, when we've transferred our technology over to other countries, including Indonesia, predominantly was using rice straw, which can be a bit more abrasive during the manufacturing process but we're definitely on top of that. In regards to the specifications, basically the straw's got to be mature, cut and wind rowed prior to the bailing. It's interesting, it originally was 230 ml to 400 ml of stubble that we crafted. We're actually finding that we can use shorter stubble now too. So again, our machinery has become that far along that we're able to use a lot of varieties and lengths. Basically we just want it fine and fibrous strength is really what we need for a good, strong panel core.

Graeme Anderson:

Yeah. And then bailing, you don't want anything that's really super compressed already.

Steve Layfield:

Yeah, it should be too... We generally pick up the eighty by four by four bales. High density bailing, there can be issues and so too, looser straw can cause us issues as well. Yeah, somewhere in the middle is pretty good and we try and get a moisture content of around, I think it's 14% is what we're after as well. When straw bales are stacked or field dried, we usually take the top bales off and take the straw underneath that.

Graeme Anderson:

Okay. Just from a straw and storage point of view, are you after stuff that's fresh out of the paddock or can straw be stored for a while?

Steve Layfield:

Yeah, it can be stored. We do have barns at our factory as well where we're purchasing and keep that stock and let it dry out in the barn. Obviously if it's damp straw, it can cause wet spot in the manufacturing process, so we always check that before we put it onto the machine, for that moisture content. Yeah, generally, storage under cover where we can, including on site, otherwise if it is field dried, they we take the top bales off and dry those out in our barn and then take the rest of the straw from there.

Graeme Anderson:

Very good, thank you. Questions rolling in, we've got one about, "How many tons of straw are needed for that three bedroom house?".

Steve Layfield:

Basically it's one ton of straw yields about 50 square meters of panel. So I'm not too sure on the calculations with the, what did we say before? I'll just check.

Graeme Anderson:

That's one you can work on in the background there, Steve.

Steve Layfield:

I can. All I can say at this point is it's about seven acres of stubble.

Graeme Anderson:

Yeah, that's cool. That's great. A question from Colin, Steve, "Can the Durra Panel gain any preferred installation in any sort of government social housing projects, which are also incorporated increased energy efficiency?" So any comments on that?

Steve Layfield:

Yeah definitely. Look, like I mentioned before, we've already got a long track record with social housing companies like Kids Under Cover, which we've had for 30 odd years. And also Anglicare as well. So I'll definitely have a look into that but it is a really good material for that because it provides that thermal mass. Also being locally manufactured it's a good thing. The other thing the panel has for it with these environments is that it's low maintenance. So it's very high impact resistant and unfortunately those circumstances that's a product that is required. So their alternatives to social housing is actually having timber studs and the studs would be at and then they'd have to line them with chipboard and paperboard before they then plaster it, just to get that impact resistance. So instead they just use our Durra Panel as that sort of one stop product.

Graeme Anderson:

Okay thanks. Thanks. I will give you a bit of a spell Steve, thanks everyone for the questions coming in too. They're rippers. So Ray, just that there is a question from Michelle around the Krone Premos machine. Does look amazing. How does it handle at 2.5 ton per hectare stubbles and does it leave the paddock suitable for sowing? Any observation or comment there, Ray?

Ray Davies:

Yeah. So the harvest technique is to get the grainer or the header to go through as close as possible to the grain, which probably most people are familiar with. Some of the stubbles in the high rainfall zone are pretty heavy so some of the operators are growing feed wheats that are yielding 10 to 12 tons to the hectare. So that's the sort of biomass that we're talking about. It would be then wind rowed ready for pickup by the Krone. The height at which it's cut would be I reckon about beer can height grown, so that it's nice and ready to go in with the cropping gear for sowing in the next winter's crop.

Graeme Anderson:

That's right. No thank you, that's terrific. I guess that makes the point, Rachel's made a good point, it's great to hear about these exciting projects and just curious about how much stubble's left on the ground when the stubble's removed. Is there a risk of too much... Taking too much and putting the soil condition at risk? I guess that's part of what we're saying at the beginning, that retaining stubble's really critical. Where this really comes into play is for those either seasons or places where we're dealing with pretty high loads of stubble. So that sort of 10 ton crop there you have got 5 and 10 ton of stubble or more there, that's in addition to trying to leave the two or three tons, which we're trying to leave for stubble retention. So yeah, no that's fantastic. So this is a technical one, how many heat units to the ton of pellets? You don't have to answer that right at the moment because at the end we will offer your contact details so some of these can be taken up-

Ray Davies:

It's a good question Graeme and one that I've got a little bit of an indirect answer for if I could. I know I will get to understand what a ton of pellets produces in terms of megajoules of energy by comparison. What I can say is that the business case allowed for a 180 kilowatt system operating at peak capacity and that the volume of pellets is estimated to be around about 200 tons per annum.

Graeme Anderson:

Yeah great. Yeah. Fantastic. Thanks a lot Lachlan Campbell doing great things up in the northeast there. And it's pretty powerful, that photo you show, Ray, of the smoke of showing a paddock of stubble that's put basically 150 tons of stubble in the atmosphere of smoke, when that same, roughly equivalent amount of energy could heat a whole hospital for a year and employ a few people in the process. Displace fossil fuels. There's a few wins in there. So I get why you're excited. So Gabrielle welcome, "Have the calculations been made on reduction in emissions from reduction in stubble burning versus the burning in the bioenergy system?" I guess... I'd just sort of probably comment that that would be part of it I guess in any discussions with working out the calculation here. Because there's a few different things about how well it's burnt in a paddock versus the high quality burning in a proper facility. So good question. I think we've got a lot more work to do though Gabrielle on... And both of the straw panel and these productive uses about the carbon story of them, will all vary depending on the actual site and how much energy's used to harvest and transport and how things are treated there. So there's plenty of room for us to answer that.

Ray Davies:

And Graeme we know that the... Or the business case also reflects a reduction in emissions with use of pellets compared to LPG. I just haven't got the number in front of me at the moment that's all.

Graeme Anderson:

Yeah. And good question from Fiona Robertson. Soil guru. She can help us with this. "It'd be great to see productive uses of excess straw, just interested in the question of how much can we sustainably remove from a paddock and that trade off with benefits to the soil." So again I think that's part of the questions that we can understand more about. And part of this too is not so much about taking perhaps this volume of straw from the same paddock each and every year. It's probably going to be something that's well more suited to particular... You know it's rotated around a particular farm that's in the business of grain production. Because farmers are pretty keen on retaining organic matter and also trying to build up the carbon stores themselves with soil. So that's all part of the mix. And as we know with straw too, you're also taking... There's a nutrient cost of anything that you take out of the paddock, whether it's grain or straw. So all of that's part of the costs and making sure people paid enough to at least replace that.

Graeme Anderson:

So there's some more questions from Jo, welcome Jo. Question for Ray, great initiative for farmers in the local community, approximately how many tons of stubble might there be available in the western districts of Victoria? So you had a good... You could probably just repeat... Just the few farmers you're working with, there's some pretty significant figures there just with that small handful of farmers.

Ray Davies:

Yeah. I can give a response to both of those. So 50,000 tons across 14,000 hectares. So that's at an average yield of three and a half tons. We know the guys are getting well above that in seasons like we've just had.

Graeme Anderson:

That's how many farmers Ray? That's only-

Ray Davies:

Nine.

Graeme Anderson:

Nine farmers. So there's a few more than that across the whole western district, isn't there?

Ray Davies:

Yeah so I saw some figures recently from Sustainability Victoria, who'd mapped biomass materials and the estimate for this part of the world was 1.9 million tons annually. So that's some significant energy potential right there.

Graeme Anderson:

Yeah. No that's significant. Yeah that's terrific. So there's plenty of room. So Colin's popped in and said, CISRO did some work and at least one ton a hectare is needed to sustain soil carbon and minimize wind and soil erosion." So that was the beer can height. But I think with a lot of those resources we pointed to earlier, between the one and the two and a half ton of residual was needed. One question that pops up a bit is about, well if there is some tonnage of straw that's removed from the paddock, it actually does have some embodied fertility or nutrient in it and so the question is, what sort of prices might farmers expect or need to be paid to make that worth their while so it's in front? Any observations from Steve or Ray around, sort of, costs? Or feel free to pop in to Colin because I know Colin's probably crossed some of this.

Ray Davies:

I'll come in for a start if you like Graeme to the study that we did about three years ago when we looked at low cost straw bale production. Trying to maximize the capital investment and all of those other inputs to produce a ton of straw through large squares. And I'm pretty sure that the nutrient factored into that equation at the time. I just haven't got the number there, sorry.

Graeme Anderson:

No, it's okay. That's good. So thanks to everyone with those questions. I mean there's some really good stuff here. It's a hot topic. I really hope we can see a lot more of this sort of thing happening in future years and while we don't have all the answers now, it's all part of when we... You know, humans are smart when we put our brains to it. And so there's been a couple of great examples here today of the smart work that you're doing. I'm just going to finish with a question to you both about, in terms of the next five or 10 years, if we wanted to see more productive use of stubbles and straw like this, what sort of things do you think are needed to try and actually get more productive use of straw? So I'll start with you Steve, if you've got any thoughts on what sort of things might help us grow this amount of activity?

Steve Layfield:

Yeah, well definitely. I think we can play a part in that. I mean at the moment we sort of average around... Purchasing is 3,000 or 5,000 tons of straw a year, or stubble I should say. So I think, as mentioned before by even the chat box if people or governments are using initiatives to use locally sourced materials, building designers choosing... Making better choices in building materials and things like that, then we're essentially locking this carbon away into a useful product, in lieu of timber and plasterboard products. I think that's just got such a positive impact on the environment. And just, at the end of the building's lifecycle, it can go back into the ground at the end of its useful life. These days people are... Building life cycle or the age of a building is... It's not long at all really when you look at houses or bathroom renovations and kitchens and how long they stay around before they're pulled down and redone and material throw away.

Steve Layfield:

You think about all the resources poured into that, it's enormous. But I think it's starting to change. And we're definitely noticing a big nudge in people using better materials in the building industry. I think if people keep pushing that we can hopefully purchase more and more stubble and produce more and more square meters of panel that can across, over the world.

Graeme Anderson:

Thanks Steve. Just on that, so you both said the factory's at Bendigo. So how many people does it employ at that sort of plant?

Steve Layfield:

We generally have about 30 people employed. Because on the other side of that panel, we also roll form our own steel sections as well, which as you know Graeme it's our full ceiling and wall systems that we do. So there is a large... A good impact on that as our business grows with using local transport, local suppliers and obviously the local workforce in that rural Victoria.

Graeme Anderson:

Okay. No, that's great. Great little insight into the potential of the future. So there could be one in lots of regional towns in 20 years’ time. Here's hoping.

Steve Layfield:

I think the big movement that we've seen as well Graeme is we're actually in the midst of technology transfer into another country too. So there will be the same situation where they have enormous stubble that they... They would actually, this company actually grow their own wheat and they want to do the whole thing. So sell their crops and also use the stubble to manufacture Durra Panel. So that's really exciting for us. That should be happening at some stage later this year.

Graeme Anderson:

Very good. Thanks Steve. Much appreciated, you joining us today and sharing your story. And Ray, You've done some great work up there for Pyrenees Shire, congrats and if we're trying to encourage more of this sort of work and more productive uses of straw in the next 5, 10 years, what sort of things from your point of view you think will help?

Ray Davies:

I think there's got to be good collaboration across government at all three tiers, so local, state and federal, to consider wheat straw but also biomass in all its forms as essentially a technology that can provide base load power that's available 24/7 irrespective of what weather conditions might be. There's an opportunity waiting. I'd also say that there's an opportunity for the university sector here as well. I guess the interest that we have locally at the council is it's about supporting the resilience of rural and regional communities by providing new job opportunities and also the prospect that whereas currently we're importing equipment from Europe, I'm sure we've got people smart enough locally that could manufacture this stuff in this country that could also add to jobs and growth locally.

Graeme Anderson:

Yeah. As you mentioned Ray, some of our closed... The closed systems. You've got employment and income generation all happening at that local scale. Because this is really something... There's a limit to how far you want to bring straw and biomass from. So it's got this nice neat little tie in to rebuilding and supporting rural economies. So yeah, so congratulations on the work you've been doing. Now for both Steve and Ray, what's the best way of getting hold of you if people want to contact you afterwards? Ray what's the best way to get in touch with you?

Ray Davies:

Yeah, they can send me an email at Ray.Davies@Pyrenees.vic.gov.au.

Graeme Anderson:

Great, thank you. And Steve?

Steve Layfield:

Yeah it's just Steve@Ortech.com.au. I could put that in the chat box if you like.

Graeme Anderson:

Yeah, great thank you. And I'm sure Heather will follow that up too. So want to thank you Heather too for organizing the webinar today. You've done a great job. Thank you very much. Thanks to everyone who's joined us. Heather are you still there?

Heather Field:

I am still here. I did drop out a little bit during those questions, a little internet issue but I am back. So I did get to enjoy most of the answers to those questions. Thank you everyone for the great discussion and the great questions. It's been quite an interesting topic and one that there was certainly a lot of interest in. So we did have about 60 people online today joining in live. I'm sure even more will join and listen to the recording as well. So everyone who has registered today will get an email from me shortly with the recording and also some details for future webinars. So I would also like to thank Ray, Steve and Graeme for their presentations today. And certainly a lot to think about there. And if anyone's got any further questions that they didn't get answered today or think of, yeah, just let me know and I can pass those on to Ray, Steve or Graeme. So thank you everyone. Enjoy your afternoon and I'll make sure I get the recording out to you as soon as possible so you can have another listen if you need to.

Graeme Anderson:

Thank you.

Ray Davies:

Thank you.

Graeme Anderson:

Thanks everyone.

Steve Layfield:

Thank you.

Graeme Anderson:

See you.

Heather Field:

Thanks everyone. Bye.