CROP packaging ASSOCIATION

News

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Innovation through technology

Despite the recent gloom and doom, farming today is still a hugely important and fundamental part of this country's output. It is not by accident that the UK is one of the highest performers in output from the land; we know how to do and do it very well. It could be argued that we are all just harder workers than elsewhere in the world, but this will only ever be partly true! Innovation through technological advances has done so much to further the industry than anything else. When this is examined a little further, it is amazing to chart the progress that has occurred in milk output, for instance. If we accept that innovation comes through advances in technology, then the huge increase in milk yield we have seen over the past 50 years is through the introduction and application of these innovations which are responsible for producing far greater nutrition from the assets available to the farmer.

Let's look at how the numbers stack up; in the 1950s a typical herd was 17 cows, with an annual yield of 2,870 litres each, from grazing and hay bales with weights of no more than 25kg. Remember, these were small bales or, more accurately, bundles, difficult to handle, extremely labour intensive and wholly inefficient, but were absolutely necessary to ensure the stock had winter feed.

30 years later, this had changed considerably, average herd sizes were 57 head of cattle, each now producing 4,670 litres, a massive 60% increase in the animal's output. Farming methods had changed drastically in a generation and so had the challenges and obstacles for the dairy farmer. With huge advances in forage conservation now possible, silage clamps were very soon full from first cut, often filling before first cut was finished, so the baling of silage was now essential to maximise the feed potential from the land. Round baling of silage had now become a very important part of farming and with bale weights of 500kg possible from the machines of the day, a huge advance from a generation earlier, the option of round bale silage flourished to allow much more flexible farming methods.

By the start of the 21st Century silage baling has become extremely important, huge advances in baler technology now make it possible to produce 900kg silage bales, a massive benefit to the dairy farmer as he needs to ensure output of at least 500 litres of milk for every fresh weight tonne of forage produced. Herd sizes are now up to 120 head, with a yield of 7,400 litres each and round bale silage provides a perfectly balanced feed to maintain milk quality as well as being a way to maximise farm profits.

Unfortunately, with progress comes change and, over these times much has changed on the farm concerning farm management and regard for the environment. There were no environmental restrictions in the 1950s, for instance. The earliest baler twines were sisal, of course, and this provided no worries of disposal at all, being 100% natural it would simply rot down. As polypropylene twine was introduced in the early 1970s, this was simply removed from the bales and burned. By the mid 1980s, concerns of air pollution were being discussed and restrictions were introduced to try and manage this. Burning became less frequent and farmers soon found another way to dispose of their used net and film by digging a deep hole and burying it.

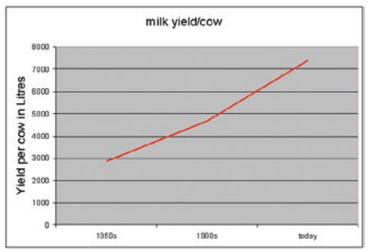
In 2006, agricultural waste restrictions were introduced, bringing in the, so called, Duty of Care, which meant that all farm plastics must now be disposed of in a managed and approved way to be re-cycled. This should have come as no surprise to anyone, given the mood of the country with regard to such things and, when one considers the huge quantity of plastic used in the making and preservation of silage every year, it was surely inevitable that something would be demanded. Disposal, through approved methods, does not come

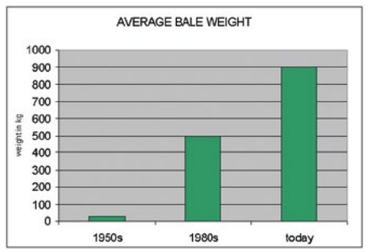
cheap and the associated costs and penalties for non-compliance are a big concern to all dairy farmers. Often, the finger is pointed at the plastics manufacturer as being the bogey man in all of this, though this is not really a fair accusation, as they are only responding to a demand that exists. What is more important is that something be done to reduce the impact of this demand.

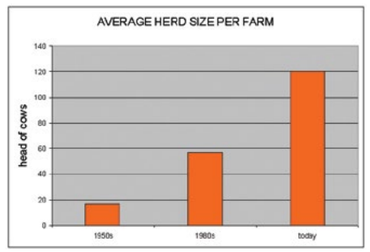
Innovation through technology is what brought us here and so it continues to this day. November 2007 saw the full introduction to the European market of a brand new round bale netwrap that brings an immediate answer to this vexing point of farm waste plastic reduction. Tama Marathon 4,200m with Bale+ technology and its fellow OEM brand equivalents that too are manufactured with this innovation (look for the logo on the packaging sleeve), offer a solution to the problem. Through the innovative use of much higher specification raw material polymers, Tama have been able to reduce the weight of the net by almost 25%, which naturally translates into 25% less plastic to do the same job as old 'standard' netwrap. What is amazing in all of this is the new net is actually stronger than 'standard' netwrap even though it is slightly lighter.

What this really means, is Tama's innovation through technology has given a massive reduction in the amount of waste plastic without any compromise in quality or performance and, as well as a reduction in the actual waste plastic, being 40% longer than 'standard' 3,000m netwrap rolls, there is correspondingly less packaging waste to dispose of too.

	Typical herd size	Bale weight	Milk yield/cow	% increase from previous generation
1950s	17	25kg	2,870 litres	
1980s	57	500kg	4,670 litres	62% increase
Today	120	900kg	7,400 litres	58% increase







Technical developments

Throughout Europe there are a good number of netwrap producers offering product that, apart from slight differences in the colour of the side thread and the brand name, are essentially the same. Most have very few features to help the end user; fewer still have much success of being able to cover the bale fully, which is a known fact for 'standard' white net. We are all aware of one producer's commitment to continuous product improvements and Tama have done it again, with a netwrap that is impossible to 'ladder'.

It may be hard to believe, but netwrap is manufactured in exactly the same way as any knitted item of clothing, using the same stitch as that used in pullovers or socks, though on a much larger scale of course! Having the same stitch and knitting method, netwrap also suffers the same problem as knitted clothing; in that it is possible to pull a stitch out, which leads to an end-less laddering of the garment, or net. Through an ingenious modification in its manufacturing process, Tama's new technology net now makes such a problem impossible.

The problem of 'laddering' is a very common thing in netwrap, where the stitches are so big, allowing the threads to become snagged or broken very easily. This, in turn, provides a loose thread able to be pulled and so the 'laddering' begins, which will then separate the net at the point of the laddering. Tama's new technology makes this problem a thing of the past, yet one more small point addressed to try and reduce operator problems and increase efficiency.

this problem will be a thing of the past. The new net from tama will not ladder like this

Film – why has this not changed?

First came round bale silage, a huge innovation and something that would prove to be a huge benefit to all farmers with stock to feed, or an abundance of grass that needed to be conserved. With this huge bale of heavy silage, which needed to be kept air-tight, we took to silage bags as if they were the best thing since sliced bread.

This was all good and well for a few years, until the realisation that the bale was, essentially, contained inside a balloon, not good for the best fermentation unless all the air could be expunged before being tied up, which we all knew at the end of a long day was nigh on impossible. Heaven forbid if that 'balloon' was ever damaged during handling or storage, as one small hole could allow air to circulate around the entire bale, rendering it almost useless when feeding out, and what a smell! So, the introduction of stretchfilm to wrap bales was seen as the huge revolution that it surely was, quicker, easier, far better for the subsequent quality of the bale, but requiring an investment in machinery, expensive machinery, to enable it to be used.

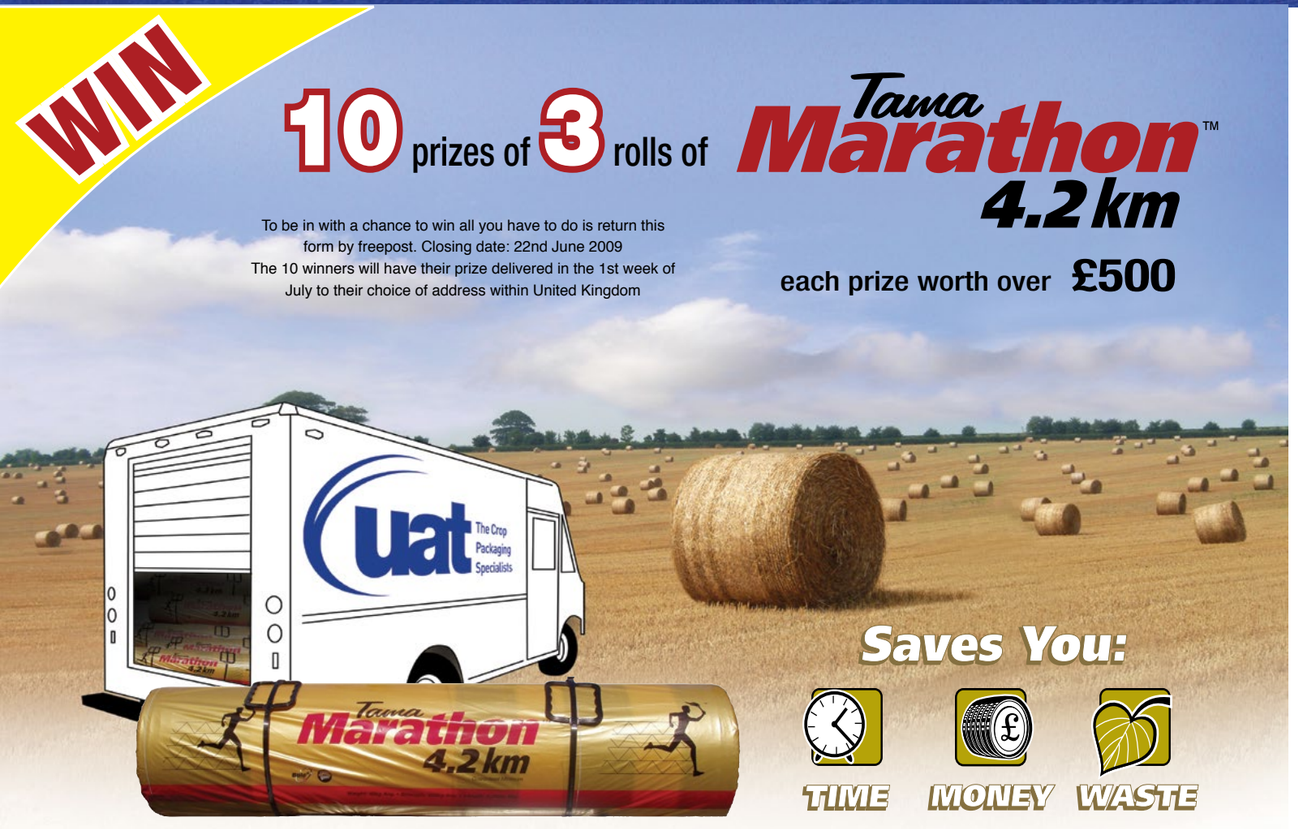
In the early days, the pace of development was fast, with advances in bale wrapping technology. Though it soon became obvious that pushing a bale along the ground, whilst trying to wrap it with thin film, and keep it air-tight, was sheer folly when being rolled directly over the grass stubble from where it had just come - a perfect recipe for disaster and a beautifully perforated bale. Bale wrappers soon moved onto the turntable concept, turning the bale as it rolled on the turntable, with film dispensed from a single roll. Better, faster but it could be made to be faster still.

Twin satellite wrappers were the next step, instantly doubling the output of the machine, a huge step in helping it keep pace with the baler, at the same time the film producers made their big step forward too…increasing the film width from 500mm to 750mm. 50% greater width to the web of film going onto the bale than before, reduced the need to turn the bale so much, again adding to the increase in output for the wrapper. This move from 500mm to 750mm happened over 20 years ago, in fact, not long after the invention of film to wrap bales. It was quite an big thing at the time, but since then … has there been any real advance in wrapping bales? One could argue that the step from mono layer film to co-extruded film, made from more than one layer of extruded resin, not strictly a laminated film, merely the same film being produced from more than one recipe bowl at the same time, was a step forward. It was still 25 micron thick, still the same size and method of application – so no real advances as far as the end user.

Today, almost 25 years later, and things have not really progressed much further. The end user still has to climb out of his tractor cab and remove and replace 2 rolls of film every 60 bales, or less if wrapping using the 6 layer method. This could mean up to 10 re-loads in a day for a typical wrapping day, considerably more if wrapping haylage. Lifting and replacing 20 rolls of film, at 26kg+ each, is a tiring and time consuming part of the bale wrapper's day, yet it is still this way over a quarter of a century after this method of forage conservation was invented. The product, by its very nature, is susceptible to damage. Thin film and heavy rolls are prone to scuffing from lifting and handling, resulting in damage leading to breakages when wrapping - more off and on the tractor. The way the bales are wrapped, through the very nature of trying to completely contain a cylinder, or rectangular cube, with film from a roll rotating around the bale is a recipe for waste. In these days of wildly increasing raw material prices, it is frightening to consider the wasted plastic on each end of every bale.

Until a wholly different way to wrap a bale is invented we would seem to be stuck with this method, although, one does wonder from which direction any advances in bale wrapping would come. Are the film producers simply making the product that the machines need to use, or is it the other way and the manufacturers of the machines are restricted in what they can design and make because of what's available to use on them? If modern bale wrapping machines have the power and ability to lift and handle heavy bales, with weights often up to and over a tonne, could there be a market for a machine that could lift and handle a 'jumbo' roll of film to allow all-day bale wrapping, perhaps even allowing non-stop bale wrapping for many days without replacement of the film roll?

Any moves in this direction would, or course, necessitate a redesign of the machine, but think of the potential in a market where everything else mechanised is moving into bigger, faster, more efficient. Bale wrappers and bale wrapping film remains in the doldrums of 750mm width film, with a typical maximum yield of 30 bales each, or machines that provide as much waste plastic as they give benefit to wrapping the bale – hardly any advance from 25 years ago.



www.croppackaging.com

Number of SILAGE or HAY bales per year

☐ Up to 1,000 ☐ 1,000 - 5,000 ☐ 5,000+

Number of STRAW bales per year

☐ Up to 1,000 ☐ 1,000 - 5,000 ☐ 5,000+

Quantity of Netwrap per year

☐ Up to 1 pallet ☐ 2-5 pallets ☐ 5 pallets

Type/Brand.....

Quantity of Stretchfilm per year

☐ Up to 1 pallet ☐ 2-5 pallets ☐ 5 pallets

Type/Brand.....

Make and model of baler and/or wrapper

.....

☐ Please tick this box should you not wish to be kept informed about our crop packaging offers and market information

Code: Crop-13

Name:

Company:

Address:

Postcode:

Telephone:

Mobile:

E-mail:

Conditions:

1. This is a FREE prize draw – entry is FREE to anyone except employees of Tama, or other suppliers approved by the Crop Packaging Association.
2. To enter, simply fill in this competition card and return to the Crop Packaging Association, Freepost (SCE6386), Alton , Hampshire, GU34 1BR or visit our website: www.croppackaging.com.
3. Closing date – 22nd June 2009
4. The winners will be notified in last week of June 2009.
5. The winners will have the rolls delivered to their choice of address within United Kingdom by 1st week of July 2009
6. Prize deliveries will be managed by UAT.
7. Decision on winner is final – No correspondence will be entered into.

Baler Twine – nothing special anymore

How many readers can remember the introduction of Polypropylene Baler twine in the early 1970s? It was a big step forward at the time, which brought about so many changes that, hitherto, could not be achieved with traditional sisal baler twine. Up to that time, the price of twine was determined, to a great degree, by the success of the sisal crop harvest in Tanzania or Brazil, the natural sources of the raw fibre for the product. A poor sisal season meant shortages, which meant increased prices. Polypropylene would see an end to this and also bring with it lighter pack weights, longer pack lengths and greater twine strength.

Today, over 30 years later and we are at a point where polypropylene twine is no longer a speciality, it has become 'commoditised'. As every twine manufacturer strives to be the cheapest and best value for money, differences have disappeared and many makes of twine are now able to do the job of baling well.

Operators of the current breed of high density, large square balers know exactly what they need from a twine, to ensure profitable operation and reduced risk of expensive down time from twine problems. With so many twine producers vying for the UK's valuable business, there are now a great number of suppliers willing to offer their product, some well known others less so, though in all of this it is the actual performance of the twine that determines its success, not, necessarily, the name or reputation of the producer from whom it came. This point has become more relevant as a number of producers, traditionally able to hold their head up as a 'market leader' have resorted to 'out-sourcing' some product to sell alongside their own manufacture, to try and ensure their competitiveness. In other words, the manufacturer has become less of an importance in the world of big bale twine supply, the twine's performance and reputation are more critical.

This is not without some risk, however, as for some producers the way to get a stronger twine is to increase its thickness and, with that, the need to reduce its length accordingly. Unfortunately, the twine length in each pack cannot easily be checked. This is due to the way most big balers nowadays use double knotters, necessitating the baler drawing from two spools for each twine on the bale, with one spool providing for the top of the bale whilst the other gives twine for each end and the bottom. This means completely un-even spool use for each twine, resulting in some running out before the others. In this way, it is almost impossible to monitor how many spools are used for any given number of bales, so hiding the exact pack length, without lengthy and difficult calculations. It is all taken on trust from the twine producer!

Over the past few seasons, owing to a greater variety in supply, the name, colour and spool dimensions of Big Bale twine has also shown some variation and has caused no hardship at all. Traditionally, Big Bale twine has maintained its rust-orange colour over the years, mainly because of the beneficial characteristics this offers, the raw material that gives the colour, ferric oxide, providing a natural UV additive to the twine and also giving the twine a certain abrasiveness which assists in holding the knot. Spool height and diameter are a completely minor point, suggesting nothing of the quality or strength of the twine and everything to do with the actual spooling machine the product was finished off in. It would be a bit like buying eggs in a box compared to a flat tray, the eggs are still the same, it is the method of packaging that is different. So it is with twine, as long as the twine spool fits the baler, its shape has no bearing on the quality. Many producers have many, many spooling machines and depending upon production scheduling may find it necessary to alter the machines used, so offering slightly varying spool dimensions at times.

The safer bet would be to make sure you know the quality of your twine supplier, rather than trying to find out exactly who has made it, as these checks will have been done already by the supplier, if he's trustworthy. Go with a well known brand name, preferably one that shows some kind of assurance of conformity, one good example would be the recently introduced Sima 'trademark', shown on some brands of Big Bale twine that confirm its pedigree as assured by the maker of the actual machines on which the twine is produced.

Spend a few pennies, save a few pounds

When you come to buying your season's netwrap requirements it is easy to miss the subtle differences in the various makes on offer. Apart from the colour of the rolls, it would appear there is little difference in them at face value; however, there is a lot you should be aware of before you commit to, what seems like, a bargain. It is fair to say that there are different grades and qualities of net, and their price is a definite indication of their performance and value for money, history and experience has shown this to be true.

Netwrap originally evolved to speed up the job of round bale making and, as such, the original 'first generation' netwrap gave a much better protected bale than anything twine could achieve. Since then, it seems many, if not all other; netwrap manufacturers have not moved on and are still producing a netwrap with the same performance characteristics as they had over 20 years ago. This is where the big difference in netwrap performance and value for money come into play.

More than ten years ago, the market was introduced to the term 'Edge to Edge' with regard to round baling, when Tama brought out their now familiar striped netwrap. Some thought it no more than a marketing name as "all net went edge to edge", although very soon it became extremely obvious that the introduction of Edge to Edge had created a difference in the market, as the old, original net did not cover the bales very well at all! There now was a choice between 'standard' netwrap – the original, white netwrap and 'Premium' netwrap, Tama's Edge to Edge striped product. The difference

was plain to see and soon afterwards the baler manufacturers recognised this, recommending the premium net for their balers, as they too realised this product showed their bales to the best, which, after all, is exactly what the end user is buying – a Good Bale. Even now, over 10 years after its introduction, there are still doubters of the value of premium netwrap, but this coming season may see a radical change in the thinking of many customers, as the stark reality of cost versus value are looked at much more closely than ever before.

Is it right to spend money on a netwrap that, plainly, does not fully cover the bale? The premium net may be slightly more expensive, but that cost difference is mitigated by the benefits the net brings in its performance – if the net covers the bale it will reduce crop losses, it will reduce spoilage and wastage in silage bales, by eliminating the fluffy 'shoulders' on bales that trap air when wrapping. These exposed 'shoulders' when baled will lead to mould formation within the bale, caused by the presence of air trapped in them when the film is applied. Wastage in a bale is difficult to quantify accurately, but even if one estimates that mould on bale ends, caused by this trapped air, can account for 5% wastage in a bale, this is the equivalent of one in every 20 bales that you produce being discarded immediately after you made it. Why go to the time and expense of producing and tending to the grass, cutting it, baling it and wrapping it, stacking and storing it just to waste some of these costs in spoiled forage - expensive forage. Now consider the price difference when you start looking for netwrap this season. Can you really afford to waste up to one in 20 bales, by trying to save a few pounds now?

The cost to change to 'Premium' net is not as expensive as you might think, with the security that a better covered bale will bring and the benefits of extra length in the roll compared to most 'standard' netwrap makes, meaning more, better covered bales. These can provide a higher feed value for your cattle, be it in increased milk yields or increased weight gain through more high quality feed per bale, all for probably less than 5p per bale.

Many readers of this may not buy netwrap at all, but trust someone else to have made the correct choice, and the bale's ultimate 'end user' – the farmer, who is feeding the bale out, is the one who should be taking notice of what netwrap has been used to wrap his bales. Do you know if your bales are as good as they could be, is your baling contractor giving you the best bale he can make?

Now, ask yourself, isn't spending a few extra pennies worth the long term gain in feed value from your valuable bales next year a sensible proposition?

CAST YOUR MIND BACK 25 YEARS ...

25 years ago these were the 'cutting edge' of technology… compact discs were the latest invention, replacing floppy discs, mobile phones had got smaller - at least to the size of a house brick and this was the latest thing in personal computers !.. and the same time, netwrap was the new thing for round bales.

The pictures of bales below were all taken in the past 2 seasons, those on the left clearly showing that technology and performance of 'standard' white net has not changed in 25 years, unlike the performance in bale coverage that is possible from Edge to Edge netwrap.

More weight and more value means more care

It's hard to believe, but the idea of baled silage, which we all take so for granted nowadays, was revolutionary some 30 odd years ago when it was introduced. Up to that time, the choices open to the dairy and beef cattle farmer, aside from open grazing, were traditional chopped silage in clamps and hay, when the weather was 'on your side' (some things have not changed). To be able to bale up your valuable forage into a package that was not only convenient for use around the farm, but offered far less waste per tonne than clamp or pit silage was a real benefit. It also gave the opportunity of making the bale a 'saleable' item, for those needing extra forage it could now be bought and transported around the country. Truly, a revolution.

Since then, things have developed considerably, as more balers were equipped to handle heavier and wetter crop. Initially, the silage was only round baled, though in time large square balers offered this option too and with it baling techniques and bale handling have adapted to meet these demands. Most importantly, however, since the early days of silage baling, bale weights have doubled, whilst the bale size and volume have remained the same.

It is this critical factor that is often misunderstood when considering the value of not only the bale itself, but the work involved making that bale and its subsequent value, monetary as well as feed, as a result of its care and handling. Consider this; 15 years ago a typical 4' x 4' round silage bale would weigh no more than 400kgs. Nowadays, that bale can, and does, weigh at least 800kgs, double the early bale yet still the same dimension and volume, through the huge advances in baler technology which can closely chop the crop and compress it into the same space so much more effectively and efficiently than a generation ago. Now, think of this in terms of % loss of crop from poor quality bales, and how much this really means. In a poorly covered bale, where any air trapped inside will cause spoilage, the % loss of the bale nowadays equates to a far greater amount than it did years ago. In other words, there is much more at risk in heavier, denser bales than ever there was and it really pays to remember that anything that can be done to increase the value of the crop inside the bale, and reduce the risk of spoiling any of this valuable forage, should be done, as the stakes are much higher with a heavier bale – there is more to lose.

The demand for heavier and more dense bales puts considerable pressure on the components involved in making the bale, namely the baler and the packaging material to hold it, be it twine or net. When large square balers were adapted and modified to handle silage bales, the obvious move to contain them was increasing the strength of the twine used. The 'original' Big Bale twine was the equivalent of what we now know as the 8,600' type twine. It soon became known that this type was not strong enough to contain a heavy bale of silage, the 4 or 5 feet long bale simply snapping the strings, through over-stressing the twines when the bale was moved. The change to a stronger twine for this application was easy, simply making the twine heavier and thicker increased the strength.

With round bales it's not quite so simple, as the net is subject to constant forces from the physical form of the round bale always putting it under tension, as the bale tries to either expand or its weight creates stresses on the net by the bale wanting to flatten itself onto the ground. The advancement of bale formation, with heavier and denser options available through more efficient balers and more intense crop chopping make it possible to pack into the same volume so much more crop, and therefore weight. As baler manufacturers advanced their designs, the 'commodity' product used to contain the forage (netwrap) did not move forward with the same pace.

Most netwrap manufacturers simply continued to produce versions of their original 'recipe' of net, so when a stronger net was needed their only response was to follow the mind-set of the twine producers, making the net heavier in an attempt to make it stronger. Whilst this was possible when net rolls were mostly 2,000m length; with longer lengths came the obvious restrictions of actual roll weights for ease of handling. Most producers soon discovered there was a compromise needed in finding the best 'recipe' for their net to give the strongest they could within a roll weight that was acceptable. As a result, most nets have remained at, or close to a maximum of 3,000m length, as longer lengths made with the same 'recipe' of raw material pushed the full roll weight too high to easily handle. One producer, Tama, is closer to the end user than all others, being farmers themselves, who has succeeded in bringing netwrap well into the 21st Century.

Leaving others behind, Tama has succeeded in making a net that is significantly stronger than anything before it, using their Bale+ technology. This unique manufacturing process gave a lighter construction of net, to allow the much longer length to be contained on the roll within the same diameter and at a workable roll weight, similar to their 3,600m length rolls. However, the advanced raw materials required to achieve this also gave a secondary, very significant benefit, of considerably higher strength. In a similar way that a higher octane rated fuel offers significantly better performance, so the same principle applied with advanced, higher grade raw material polymers. Tama's unique blend of high grade HDPE has produced the highest Relative Strength of any material ever used in netwrap manufacturing, combining the highest strength per gramme weight, far exceeding any of the other makes of netwrap manufactured.

The new net will work on all makes and models of round baler, just as Tama's other Edge to Edge netwrap does, though being a considerably stronger material, it is worth checking that the baler's tension and brake systems are correctly set up to ensure you are able to achieve the maximum benefits available from this product.

Stop and look a little closer

Every year, suppliers of silage stretch film receive complaints relating to problems that are not a result of poor quality of inferior manufacturing, but of film mis-use or problems related to the wrapping machines. While we at the Crop Packaging Association try our best to advise on how to rectify common problems with crop packaging, sometimes it is very difficult to offer advice on a solution and it is better to explain exactly what causes the problem in the hope that the operator can find the best solution for his own situation.

The end of the film being held was in the clamp of the wrapper, see how the damage has occurred immediately where the film is free

Film breaking at the start of a wrapping cycle is a very common problem, one where the film's quality is often called into question. In reality, there is no reason for the quality of film to differ at any point throughout its length and no way that any imperfection could always show itself at the same point in the wrap cycle every time. However, to understand exactly what is causing the 'failure' of the film at this point would offer the best option to find a solution.

Most film wrappers have a similar method of capturing the film at the end of the wrapping cycle, gather the film together and pull it onto the knife blade to cut the film. In gathering the film, a hydraulic clamp is often employed, which pulls the gathered film against a metal surface, at great speed. The film inside the clamp is held securely; however the film immediately outside the clamp becomes damaged as it is gathered, through being scuffed across the metal surface, a situation further exaggerated by the associated build up of tackifier from the film itself on the metal surface, which provides a very abrasive surface that easily damages the film. This scuffing leaves minute abrasions on the film's surface which, when pulled at the start of the next wrap cycle, at a great acceleration speed, begin to weaken the film and pull into holes that eventually break the film.

Note the build up of tack on the metal surface that gathers the film

Naturally, it is easy to assume that the film is not strong enough for the wrapper, but next time you suffer this problem, and you will at some time, please take time to look a little closer at the evidence that is right there in your hands, as you re-attach the broken film tail back to the bale. It is obviously much easier to see this happen when you are stood next to the wrapper's catch and cut mechanism, but as this is not often possible, allow this be the proof you need to understand what's happening.

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