

teno *bale*[®] The mantle film compressor handbook



The way for professional silage quality

Mantle film – Introduction

Mantle film offers you more protection of the bale where you need it most. The extra film protects the more sensitive mantle side of the bale which allows safer handling as well as better storage stability. Additionally, film damages by for example rodents or birds, will lead to less spoiled silage, as the area exposed to oxygen by the damage stays small and isolated.

Another advantage of a mantle film which can be stretched very strongly on the bale like our TenoBaleCompressor is, that you also get more compact bales. This puts less stress on the stretch film after wrapping when you move it with your bale handler.



On the picture above, you can easily see the difference between bales made with mantle film instead of net in the same baler. The green bales were made with mantle film, the white bales with net. Take a look at the cylindrical bale shape differences.

Mantle film can go edge to edge or over the edge depending on machine, film width, crop and field conditions. Cover edge helps to protect the stretch film from being punctured on the edge when wrapping the bales with high speed wrapper.

Mantle film can be used on various crops

Silage: Use our stretchable 16-20-micron products that handle tough conditions in field.

Maize: Use our mantle film for the best holding stability.

Sugar pulp etc.: Use our robust or stretchable version depending on width and machine type.

Straw: We have UV stabilizer in the film which makes it possible to use our BaleCompressor without stretch film on straw, but check first if your baler is capable of handling it.

During the winter time, you will experience the easiness of opening the bales and find new ways for undressing them to suit your feeding system. For example the work with bale opening devices is simplified. If you live in a country with long, cold winters you will see how much easier it is to cut off the film from the bale. The mantle film comes off directly - in contrast to net wrap, where sometimes pieces of net can be left on the bale.

Also, consider the time saving and convenience of recycling all plastic in one fraction which also includes our new smart packaging system with edge protection that comes off in only one piece.



Patented

General Benefits with TenoBaleCompressor®

TenoBaleCompressor – With patented unique features and benefits!

TenoBaleCompressor is patented (EP2516134) due to its unique recipe and manufacturing technique (PlusTech) which gives high user friendly product with very high elastic properties for highest tearing resistance on the bale (patented). The elasticity gives advantages by allowing the film to be pre-stretched at a high level in the baler with lower risk of tearing on the bale.

Highest usable stretch range on the bales on the market today

The high stretch range increases the output (bales/reel) without compromising on the toughness of the film. The elasticity gives a high resistance against damages that can be created in the bale camber or when transferring the bale to the wrapping unit. The elasticity also prevents the film from tearing up if damages occur. The level of pre stretch is always a balance between the type of crop, field conditions and temperature.

Both bales were made with mantle film used in same machine. Right bale with competitor film (16 micron), stretched 10% with 3,5 layers. Left bale with BaleCompressor 20micron/1400 mm, 3,5 layers stretched 35%. Take a look at the cylindrical bale shape differences.



Highest yield (bales/reel) on the market

TenoBaleCompressor gives you an opportunity to set how elastic the film needs to be on the bale by changing the pre-stretch of the film on the bale. You normally change the stretch on the film by changing the hydraulic brake force (in terminal) on the film reel in the machine (most common solution today). When setting different selected brake force on the film reel, the film will stretch according to your setting, before the film will reach the bale chamber.

When testing other products, always remember to count the bales to see the difference between TenoBaleCompressor and other products. Also remember to compare the products on the same day, field conditions and temperature. This will give you the real cost per bale. Products in the market can have the same thickness and meters but will yield less bales per reel due to less stretch properties in film and will then not be the most economical solution for you, if film reel is cheaper but yields not enough bales. For maximum output count on TenoBaleCompressor.

Cover Edge

If you use our wider film (1400mm) you can get cover edge. If you want to have best chance for cover edge (when field conditions allow for it) try the lower to middle settings in our recommended pre-stretch range and see if film

is going wider on the edges. If not increase to the optimal stretch again.





UV Protection

TenoBaleCompressor is UV protected.

It means that you can use the product as temporary weather protection on your bales i.e. straw.

Please keep in mind that, when doing this, not the whole bale is protected you will not avoid feed losses from weather influences approaching the bale from the sides.

For full quality storage, you need to apply stretch film.

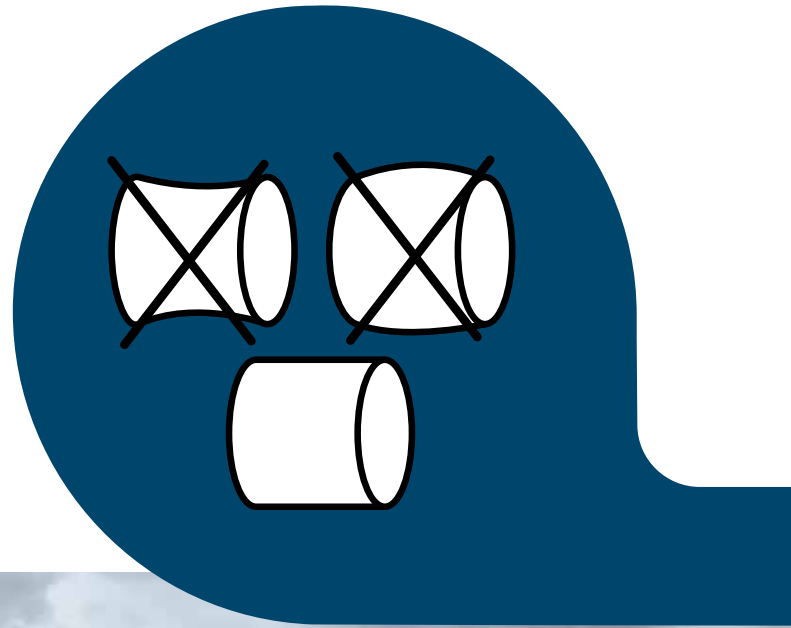
Be aware that more layers of mantle film are necessary to keep the bales together and to have enough protection to move the bales from the field.

Important facts to keep in mind for best experience of the product

Remember that good swaths and good bale shape is essential for best performance of mantle film and for top feed quality. For the highest output, cylindrical bale shape is essential. Good bale shape enables higher pre-stretch and less layers which gives lower cost per bale and tighter bales for easier transport and storage.

Well formed swaths (See picture below) will enable good and even filling of the bale chamber from edge to edge. These swaths are a little wider than the chamber. If swaths are smaller and there is not enough material to make them wider, then make them to the size of around 60% of the bale chamber width and drive zigzag from side to side to produce even

cylindrical bales. If you make swaths wider than 60% but not wide enough to fill the bale chamber evenly when driving in the center it will result in convex bale shape (higher in the middle). Going from side to side in such swath during baling process will also give too much material in the center of the bale resulting in convex bale shape. If Swaths are too wide normally the result is concave bale shape.





“Try our
bale wrap guide!
Find the best film
solution for your
requirements easily online
at
tenospin.com”

Improved silage quality

We have done silage tests in cooperation with the Swedish Agricultural university (SLU) for several years. For example, we have tested different combinations of stretch film layers on bales tied with mantle film and compared those to bales tied with net. After years of development we are now proud to present the result for our quality products with figures which are important for your production and healthy livestock. Below you can read a summary of the research done by SLU.

Department of Animal Nutrition and Management Swedish University of Agricultural Sciences



Rolf Spörndly

Rainer Nylund

- Mantel film could possibly reduce the number of stretch film layers needed

Hypothesis

Mantel film will improve seal integrity and anaerobiosis of bales and ameliorate the silage quality.

Conclusion

Replacing net with film resulted in better shaped bales, better seal integrity, higher CO₂ and less mould. But reducing the number of stretch film to 4 layers is not recommended.

Materials & Method

- 36 bales made by McHale Fusion 3 Plus
- Net or Mantel film (17µm, 1390mm, 3 layers)
- 4, 6, 8 layers of stretch film (25µm, 750mm)
- Grass-Clover ley, 45 % DM
- 6 replicates per treatment equally distributed among 6 blocks at the field

Background

- Net shapes the bale but does not contribute to seal integrity
- Net and stretch film have to be removed and stored separately for recycling



	Comparing Mantelfilm vs Net		Comparing number of stretch film layers			Mantel & layer interaction
	Mantelfilm	Net	4 layers	6 layers	8 layers	
Volume, m ³	1,67 ^a	1,71 ^b	1,69	1,69	1,68	n.s.
Perimeter, m	4,21 ^a	4,28 ^b	4,22 ^a	4,24 ^{ab}	4,28 ^b	n.s.
Density, kg DM m ⁻³	172,7	167,6	170	170	171	n.s.
DM loss, %	0,90	0,90	0,96	0,95	0,80	n.s.
CO ₂ , %	63,7 ^a	57,2 ^b	54,0 ^a	61,3 ^b	66,1 ^b	p<0,05
Seal integrity, s	938 ^a	533 ^b	165 ^a	879 ^b	1162 ^b	p<0,05
Yeast, cm ²	0,00	0,06	0,09	0,00	0,00	n.s.
Mould, cm ²	0,03 ^a	0,78 ^a	1,17 ^a	0,06 ^b	0,00 ^b	p<0,05
pH	5,3	5,3	5,3	5,3	5,3	p<0,05
WSC, g kg DM ⁻¹	7,2	6,4	6,0	6,9 ^{ab}	7,5 ^b	p<0,05
Ammonia-N, % of total	4,5 ^a	5,1 ^b	5,1	4,6	4,7	n.s.
Lactic acid, g kg DM ⁻¹	1,4	1,5	1,6	1,3	1,4	p<0,05
Acetic acid, g kg DM ⁻¹	0,4	0,4	0,4	0,3	0,4	p<0,05
Ethanol, g kg DM ⁻¹	1,5	1,6	1,8 ^a	1,6 ^b	1,3 ^c	n.s.

Different superscript in rows indicate significant diff at p<0.05

Results

Mantel film bales gave:

- Better seal integrity
- Higher CO₂ content
- More compact bales
- Less mould
- Lower NH₃-N

More layers gave:

- Better seal integrity
- Higher CO₂ content
- Less mould
- More WSC



User advices

- Make sure that all rollers in the chamber are free from sharp burrs which can cause film to tear.
- If you are a new user of mantle film, start with lower pre stretch in our stretch range of the product (see reel label). With experience go as high as possible with stretch settings and lower if holes appear on the bales, which tear up. When tearing occurs on the bale table reduce the pre-stretch first before going up in layers if you are looking at the best economy. Learn to fine tune the settings by watching the screen with bale table camera, in bale transfer process. Sometimes at higher temperatures and with more mature crop you need to reduce the stretch of the film due to higher friction in the bale chamber and the crop expansion force. When it is young crop and wetter, the moisture will help lubricating the chamber and the film can handle higher pre stretch/reduction of layers.

Stretch range of our mantle film products

Product	%
1280 * 0.013 mm * 3000 m	5-13
1280 * 0.016 mm * 2400 m	15-20
1400 * 0.016 mm * 2200 m	18-30
1400 * 0.020 mm * 1800 m	20-35

- Always feed crop with the pickup when film feeding start until spreading rollers for film move apart.
- Take note of how the bale lands on the bale table and after that on the ground when unloading it from bale table. It should land solid like a rock. With high stretch level, you can make rock solid bales that want to stay together, like stretching a rubber band.
- Remember to keep the feeding rollers clean from tack build up. Clean them regularly with brake cleaner or white

spirits. If the cleaning is not done, it can result in film feeding problems in the bale chamber, especially during warm weather.

- Output in bales per reel is the greatest advantage of TenoBaleCompressor. To learn this, you must count the bales when comparing to other products in the market.
- To check how much elasticity is left in the film you can take a knife and



make a 5 cm long cut in the middle of the bale. If the hole grows, you should go down one setting in stretch. If the hole doesn't grow, increase the stretch to find the optimal setting. You can also find the optimal setting by looking in the camera when the bales come out and adjust the stretch after if you see any bales that tear up when you are baling.

- On stationary balers keep in mind that you sometimes need to adjust the feeding intake plates for the best bale shape. A slightly concave bale shape at the edges may help to keep material with less structure locked by the mantle film, preventing it from falling down during the stretch film wrapping process. Different crops and conditions demanding different settings.

Mantle film in combination with stretch film

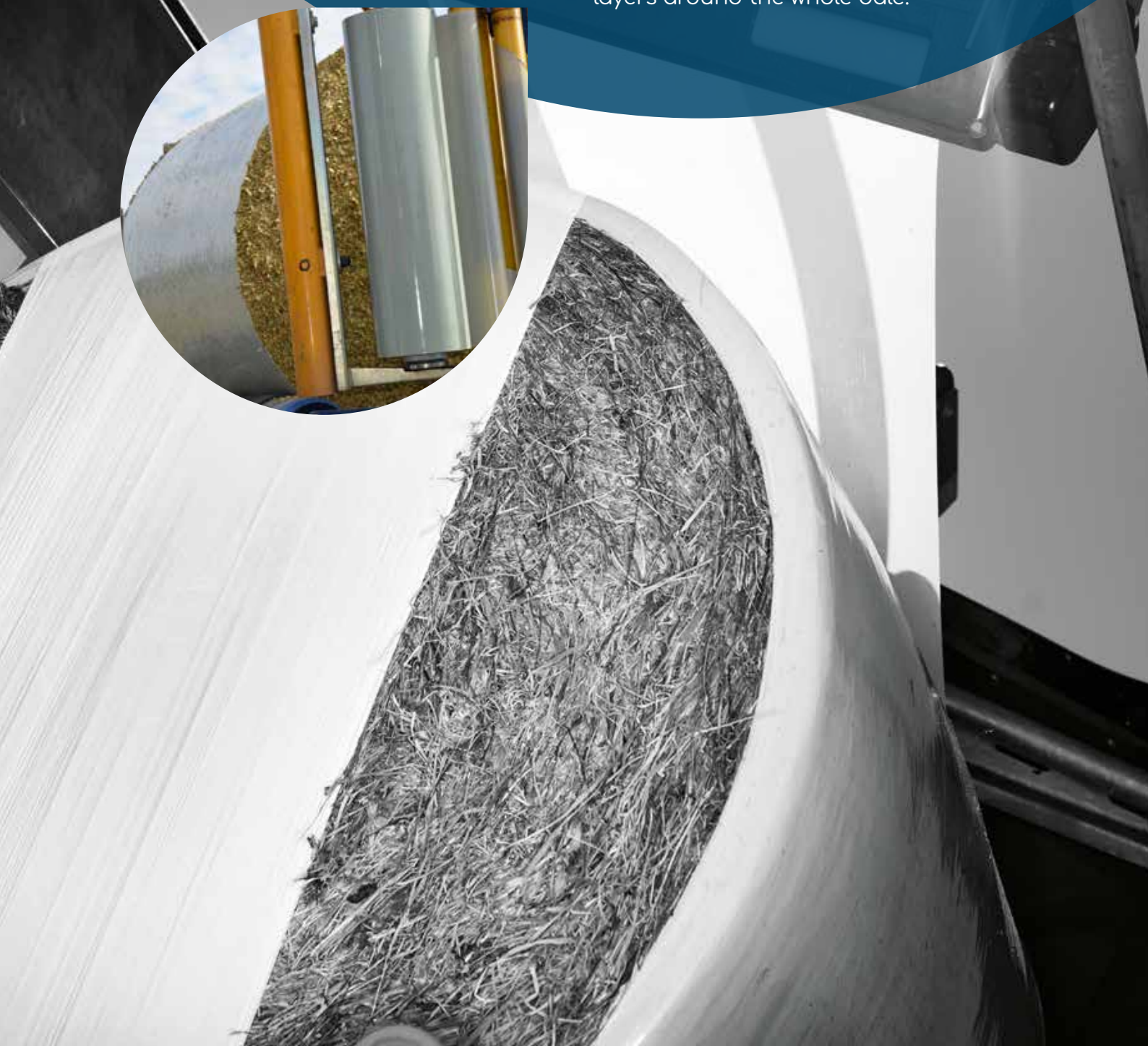
For the 1400mm wide products we have a 16 micron and 20 micron version. If you are a new user, start with our 20 micron film and when you gained some experience try our 16 micron.

These products are working well in all machines on the market that work with 1400mm width. 3,5-4 layers is enough for normal

conditions. For the 1280mm wide product we recommend the 16 microns for mobile balers. 3-4 layers is enough for normal conditions.

For the best airtightness combine our mantle films with our 19 micron stretch film with 2100m or 2600m (for machines that support it). 6 layers as minimum around the whole bale.

If you want more robust film for safer handling of the bales or want to invest in more protection for the silage, then check out our 21 micron option with 1900m or our 25 micron with 1700m. Use at least 6 layers around the whole bale.



Efficient & sustainable silage making

We know the hazards and challenges of the harvest season and we can support you with our many years of experience. If you need help, our silage experts and technical support team is there to support you to improve your yield, efficiency and sustainability in your silage making - all over the world.

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