

Cotton contamination – we must remain vigilant!

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AT A GLANCE...

Due to the increasing demands of modern spinning (in terms of speed) automation and raw material cost and the increasingly competitive global textile market, cotton fibre quality is of the utmost importance to the spinner. Quality attributes include length and uniformity, strength, micronaire, trash content, colour grade and extraneous matter – any substance in the cotton, other than plant material, such as bark, grass, seed-coat fragments, dust and oil.

In addition, the presence of contaminants in the cotton, particularly foreign fibre, can greatly affect its perceived quality and value. Various sources of contaminants, such as paper, plastic, bird feathers, metal parts and so on, can be incorporated into the bale as a result of human interaction during harvesting and ginning.

This contamination can adversely affect the appearance of the yarn, fabric and final product and is extremely costly to the textile industry, in terms of installing detection/removal equipment, downtime, material waste and the possible downgrading of yarn, fabric or garments resulting in large financial claims and losses.

So contamination in cotton still represents the number one problem for manufacturers of high-quality cotton products. It is also worth mentioning that contamination can occur, and present a serious problem, in most other natural fibres, such as wool and mohair, but seldom in man-made fibres.

IN the light of the above, it is not surprising that there are serious penalties for contaminated cotton and it has been reported that worldwide contamination related losses amount to US\$200 million per year. Once an origin has achieved a

reputation for contamination, the likelihood of it achieving base world market prices is slim and its cotton is usually heavily discounted from five to 30 per cent, even if the fibre quality is acceptable.

According to the International Textile Manufacturers Federation the major source of contamination worldwide is organic matter, such as leaves, bird feathers, paper and leather, followed by fabric and string made from woven plastic and plastic film that mainly originate from module covers for both conventional and round modules and to a lesser extent to plastic shopping and fertiliser bags and irrigation tubing.

This is followed by;

- Jute/hessian, cotton from bale covers, clothing, cleaning rags and module ropes;
- Inorganic matter such as sand/dust, rust and metal;
- Oily chemical substances, such as grease and oil, mainly due to excess lubrication, worn seals and hydraulic oil leaks during harvesting and ginning;
- Stamp colour (mainly due to using permanent markers to identify modules or bales); and,
- Rubber and tar.

The degree of contamination varies widely from country to country and region to region and is related to different farming, harvesting and ginning practices. Australian cotton has the international reputation of being amongst the cleanest and least contaminated cotton available worldwide. But the rapid adoption of the John Deere spindle and stripper harvesters which produce round modules covered with plastic wrap has increased concerns about contamination.

As 90 per cent of the Australian crop is harvested by these machines, with every round module wrap made up of 21 metres of plastic which weighs about 3.8 kg, we use on average 2710 tonnes or 15 million metres of plastic annually, to wrap the seed cotton. So it is essential that our industry does all it can to prevent plastic wrap making its way into cotton bales.

The first and most logical step to address the problem of contamination is to prevent/avoid or minimise the contamination entering the production process, particularly during growing and harvesting, through appropriate farm management and associated practices, which include;



Plastic wrap contamination.



Plastic wrap in ginned cotton.



Small amounts of plastic can cause big problems.



Wrap damage is a major source of contamination.

On-farm

- All workers should be made aware of the consequences of contamination and must be provided with the tools to clean up and isolate rubbish, for example provide garbage bins in which all waste is thrown and use only white cleaning rags.
- Where practical remove plastic and other contaminating debris from the field prior to harvest.
- Store the rolls of plastic wrap in their original packaging in an enclosed shed to avoid exposure to direct sunlight and moisture.
- Ensure that the harvester is set-up according to the Operators Manual and that regular cleaning and servicing of the harvester is conducted before, during and after harvesting has been completed.

- Use only trained and skilful operators to operate harvesters.
- When transporting modules through harvested rows with a mast-type tractor, the module should be carried high enough to prevent drag and tearing of the underside of wrap.
- Modules should be staged on a high flat and well drained areas of bare soil.
- Modules should be staged as per the method of transport and storage at the gin i.e. end to end (sausage) or at 90° from end to end (wagon wheel).

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The yellow colour does spoil the look of the fabric.

- When placing modules together for transport, a gap should be left between each module.
- Significant wrap tears must be repaired in the field prior to loading on module truck to prevent further wrap damage and ginning problems.
- Loose outer tails must be secured with 3M Hi-strength 90 spray adhesive or lint bale repair tape.
- Tag modules and notify the ginner of potential issues caused by malfunctions during harvesting.
- When using module trucks with chain beds to load and transport modules ensure that they are fitted with chains that have rounded cleats that will not puncture the plastic wrap.



A gap should be left between each module during transport.

- When using flatbed trailers ensure that modules are loaded by appropriate equipment without piercing the module wrap.

At the gin

- Add information on contamination in grower packs distributed by Grower Services.
- All workers must be made aware of the consequences of contamination during induction, with strict Housekeeping rules in place.
- Use only trained and skilful operators in the module feeding area.
- Formulate and implement standard work practices for handling and transportation of round modules.
- Moon buggys used to unload and transport modules should be fitted with chains that have rounded cleats that will not puncture the plastic wrap.
- Avoid contaminants entering the gin by installing sensors in the module feeder to automatically detect and alert gin operators to the presence of large pieces of contamination caught on the module beaters.
- Cut the wrap in the Safe Cutting Zone to prevent the possibility of pieces of wrap entering the gin.
- Stop production and clean out all machines, if for some reason, plastic has entered the gin, with the affected bales segregated and handled according to company policy.

Other

- Classing facilities should notify the gin when any plastic is found in classing samples.
- Feedback from merchants to gin/grower if any complaint received regarding plastic contamination.

Conclusion

There can be little doubt that by far the most effective and lasting way of dealing with the problem of contamination in cotton, is to prevent its occurrence at source. A 'second line of defence' remains that of detection and elimination at the various stages of the cotton processing pipeline. Nevertheless, it is unlikely that these will ever lead to a perfect solution to the problem, hence avoiding or at least minimising contamination at source will remain the only completely effective and sustainable solution. 📍



Some contamination is not easy to spot.