

Final Report

Off Farm Series | Cotton Research & Development Corporation

*If you are participating in the presentations this year, please provide a written report and a copy of your final report presentation by 31 October.
If not, please provide a written report by 30 September.*

Part 1 - Summary Details

Please use your TAB key to complete Parts 1 & 2.

CRDC Project Number: 1212

Project Title: Post Farm Gate BMP – Storage, Handling & Transport

Project Commencement Date: 1st July 011 **Project Completion Date:** 30th June 012

CRDC Program: Value Chain

Part 2 – Contact Details

Administrator: Cherie Gibb
Organisation: Techmac Pty Limited
Postal Address: 12 Inadale Court, Middle Ridge, QLD 4350
Ph: 07 4638 5278 **Fax:** 07 4638 5278 **E-mail:** cherie@techmac.com.au

Principal Researcher: Pete Johnson
Organisation: Left Field Solutions Pty Limited
Postal Address: PO Box 111, Harlaxton QLD 4350
Ph: 0409 893 139 **Fax:** N/A **E-mail:** petejohnson@leftfieldsolutions.com.au

Supervisor: Dallas Gibb
Organisation: Techmac Pty Limited
Postal Address: 12 Inadale Court, Middle Ridge, QLD 4350
Ph: 07 4638 5278 **Fax:** 07 4638 5278 **E-mail:** dallas@techmac.com.au



Signature of Research Provider Representative:

Part 2 – Final Report Executive Summary

This project comprised two key parts:

- A. The compilation and review of a Best Management Practices manual for the Storage and Handling sector of the Australian cotton industry; and
- B. The review and update of a Cotton Bale Load Restraint guide for the transport industry.

These two documents provide concise and comprehensive guidelines for the transport and handling of cotton from the point where bales are loaded from the gin, to the point where they are loaded in the container, covering off on:

- industry requirements of efficiency, quality control, OH&S and environment/community requirements;
- statutory requirements with regards load stability and safety.

The project has also assisted in the delivery of load width exemptions for cotton bale transport in NSW and Queensland, thereby improving the efficiency and safety of bale transport. In terms of labour, it is estimated that the ability to load 3 wide reduces the labour component by approximately 0.4 minutes per bale. Hence, in a 5 million bale crop, this equates to a saving of approximately 33,300 man/machine hours (plus down time for transport operators), which conservatively would provide savings of \$2.5-3 million for industry.

Future Work: The revised Cotton Bale Load Restraint Guide has, however, created some efficiency concerns for transport operators and ginners, who have raised concerns that some of the strapping requirements to meet statutory performance based load stability standards may be excessive. There may be further requirement to discuss and identify alternate preferred load and strapping requirements with ginners and transport operators based on “efficiency considerations”, and for tests to be specifically applied to determine minimum strapping requirement for each identified load configuration.

This work would require coordination between Cotton Research and Development Corporation, Cotton Australia, the Australian Cotton Ginners Association and the Australian Cotton Shippers Association.

Part 3 – Final Report Guide (due 31 October)

(The points below are to be used as a guideline when completing your final report.)

Background

1. The extension of the “Best Management Practices” concept and principal to encompass the Storage and Handling sector were seen as critical for the industry to create a framework to deliver:
 - a. Maximum efficiency
 - b. Minimal risk of country damage
 - c. World’s best Occupational Health and Safety practices
 - d. Minimal impact on environment and community.

This was seen in the context of the potential for larger crops, and the entry of new players in the storage and handling sector. In particular, the potential for capacity constraints in large

crops – and the potential for shared storage and/or outside storage of cotton bales were seen as key risks that would need to be addressed in the document.

As the project evolved, it became clear that the BMP Manuals for all Post Farm Gate sectors (ginning, classing, freight, storage and handling) would need to “speak to each other”, as processes and outcomes from each sector would impact on the next sector down the value chain. This has, and will continue to create a number of issues for discussion and resolution – some of which have already been incorporated into updated versions of the industry’s BMP guidelines for Ginning.

Bale Shape and Size, and loading configurations for road transport are key issues that this project has attempted to address. As the project progressed, this necessitated a revision of the Cotton Bale Load Restraint Guide (attached). In particular, it was recognised that the loading of bales 3 wide on semi trailers was necessary to achieve many of our stated BMP objectives.

Objectives

2. List the project objectives and the extent to which these have been achieved.

A. The compilation and review of a Best Management Practices manual for the Storage and Handling sector of the Australian cotton industry;

The objective was achieved. See attached document:

“Best Management Practices guide for Storage and Handling (Version 2) released March 2012.”

B. The review and update of a Cotton Bale Load Restraint guide for the transport industry.

The objective was achieved. See attached document:

“Co-ordination and assistance in finalising a workable Cotton Bale Load Restraint Guide (2012 Version) released August 2012.”

Methods

3. A. Forums: A number of forums were organised in the initial stages of the project including:

- i. Post Farm Gate BMP Workshop – Cotton Collective, August 2009
- ii. Storage & Handling BMP Workshop – Sydney, November 2009
- iii. Cotton Freight & Handling Meeting – Toowoomba, May 2010
- iv. BMP Update / Workshop – Moree Services Club, October 2010

On Site Consultations: A number of on-site meetings were also arranged between Left Field Solutions and service providers including Australian Wool Handlers, TF & S Woods, Auscott Pty Ltd, Namoi Cotton and Namoi Logistics to better understand issues raised during forum discussions.

Compilation of Bale Load Restraint Addendum: At the conclusion of the Cotton Freight & Handling Meeting in Toowoomba 2011, an addendum to the industry’s

existing Bale Load Restraint Guide was produced and distributed to industry (see attached).

Compilation and Review of Storage and Handling BMP Version 1. An initial Draft Storage and Handling Best Management Practices Manual was distributed to industry for comment prior to commencement of the 2011 harvest and ginning season. Version 1 was finalised following this review process.

Trial Audits 2011 ginning season: Rene van der Sluijs from CSIRO Materials and Engineering completed trial audits of warehouse facilities in the 2011 season, providing feedback to Left Field Solutions Pty Limited.

Review and Compilation of Storage and Handling BMP Version 2. Incorporating feedback from trial audits.

Trial Audits 2012 ginning season: The new guidelines were included as part of the BMP audits of Storage and Handling Facilities completed. Rene van der Sluijs from CSIRO Materials and Engineering is currently in 2012. Note: Audits conducted as a separate CRDC project lead by CSIRO.

Industry Representation: Left Field Solutions Pty Ltd (representing CRDC), combined with Cotton Australia and ACSA made representations to NSW Roads and Transport and Queensland Transport to seek width concessions for the loading of bales 3 wide on semi trailers (width concession to 2.7 m on B Doubles and 2.6m on Road Trains). Cotton Australia has subsequently made similar representations to VicRoads.

Bale Load Stability Testing: Cotton Australia together with Left Field Solutions Pty Ltd (representing CRDC) coordinated load stability testing (conducted by LoadSafe Australia) at Brighann Gin to provide hard data with regards the loading of bales 3 wide (vs turning centre bales), as well as various strapping configurations.

Industry Liaison: Left Field Solutions (LFS) has been a point of contact (together with Cotton Australia) for transport carriers, Storage and Handling providers and relevant transport authorities and highway patrol on issues regarding cotton bale transport.

Cotton Bale Load Restraint Guide (2012 Version): Left Field Solutions Pty Limited has compiled an initial draft revision to the Cotton Bale Load Restraint guide which was reviewed by LoadSafe Australia.

LFS then provided assistance to Cotton Australia to coordinate with LoadSafe Australia on the finalisation of a Cotton Bale Load Restraint Guide (2012 Version) which is now in circulation (see attached).

Results

4. Key results of this project are as follows:

- a. Completion of a workable Best Management Practices guide for Storage and Handling (Version 2) released March 2012.
- b. Co-ordination and assistance in finalising a workable Cotton Bale Load Restraint Guide (2012 Version) released August 2012.
- c. NSW Roads and Transport decision to provide load width concessions for cotton bales to 2.7m for B-Doubles and 2.6m for Road Trains.
- d. Qld Transports pending decision (imminent) to provide load width concessions for cotton bales to 2.7m for B-Doubles and 2.6m for Road Trains.

Outcomes

5. Describe how the project's outputs will contribute to the planned outcomes identified in the project application. Describe the planned outcomes achieved to date.

Outcomes as listed in results

6. Please describe any:-

- a) technical advances achieved (eg commercially significant developments, patents applied for or granted licenses, etc.);
- b) other information developed from research (eg discoveries in methodology, equipment design, etc.); and
- c) required changes to the Intellectual Property register.

The IP Register has been updated to include the new versions of :

- Best Management Practices guide for Storage and Handling (Version 2) released March 2012.
- Cotton Bale Load Restraint Guide (2012 Version) released August 2012

No other technology or commercially significant information was developed from the project.

Conclusion

7. The results delivered to date provide three clear outcomes for industry:

- a. A clear, concise set of guidelines for existing and future storage and handling providers to ensure cotton bales are stored in the most efficient, safe and effective way possible.
- b. A clear, concise set of guidelines for existing and future road transport operators to load and strap cotton bale loads in the most efficient method possible, whilst still complying with performance based road safety standards.
- c. Delivery of bale load width exemptions for cotton bale transport improves the efficiency and safety of loading and unloading; the efficiency of bale transport (in terms of load configuration); the safety of bale transport (in terms of load stability).

Both the Load Restraint Guide and Best Management Practices for Storage and Handling will require regular updates. However, this may be more critical with regards the Bale Load Restraint Guide, and the following should be noted:

* Some transport operators and ginneries feel the strapping requirements stipulated in the revised Cotton Load Restraint Guide are excessive and may reduce efficiency at loading and unloading. Further work may therefore be required to identify and test alternate load and strapping configurations as outlined under the heading “Extension Opportunities” below.

Extension Opportunities

8. *Detail a plan for the activities or other steps that may be taken:*

- (a) Requests for submissions on alternate loading and strapping configurations could be made to transport operators and/or cotton ginners in an attempt to identify safer and more efficient methods. Efficiency would need to be considered from both a loading/unloading perspective – as well as the number of straps required to restrain the load.
- (b) Further stability testing would be required for alternate loading & strapping configurations submitted.
- (c) Once tested, these configurations could be incorporated into an updated Cotton Bale Load Restraint Guide.
- (d) Further development and extension will require co-ordination between Cotton Australia, the Australian Cotton Shippers Association, the Australian Cotton Ginners Association and the Cotton Research and Development Corporation.

9. A. PUBLICATIONS:

* A “Best Management Practices Manual for Storage and Handling – Version 2” has been created (see attached)

* An updated “Cotton Load Restraint Guide – Version 2012” has been created (see attached).

Both of these documents will be “living documents” requiring semi regular review and updates.

INTRODUCTION

The safe loading and transport of cotton bales and cotton modules is vitally important in preventing injury to people and in preventing damage to property.

These guidelines provide transport drivers, owners, operators, cotton farmers and cotton processors and distributors with the specific information required to safely transport cotton bales on Australian roads. This document refers to both the Australian cotton industry's "Ginning Best Management Practice" (BMP) Manual and the "Storage and Handling" BMP Manual – which aim to maintain bale integrity and quality and to improve efficiencies, throughout the storage and handling process.

The information contained in this Guide was developed after testing to confirm that the loading and restraint standards outlined in the guidelines would meet the "Performance Standards" contained in uniform National and State Regulations. The testing was carried out in consultation with the New South Wales Roads and Traffic Authority.

These guidelines should be read in conjunction with the "Load Restraint Guide", which contains additional information on all aspects of load restraint.

The legal requirements regarding vehicle mass, dimensions and loading are contained in National and State Regulations (see Appendix). In addition, it must be remembered that the common law imposes liability for negligent acts, which cause injury or damage to others, and there are many other legal requirements, which impose a duty of care in the workplace.

As a consequence of further experience and testing of load restraint systems, these guidelines will need to be periodically reviewed and amended. Suggested improvements or additions to the contents are welcomed and should be sent to:

Cotton Australia, Suite 4.01, 247 Coward St, Mascot NSW 2020

ACKNOWLEDGEMENTS

Document reviewed and updated by LeftField Solutions (Pete Johnson)

1. COTTON BALES

Cotton bales are carried on both open sided flat top semi- trailers and curtain-side (tautliner) trailers. Each method requires a different stacking arrangement and load restraint method. The **large (Universal Density)** bales are being phased out by the cotton industry in favour of shorter and narrower **High Density** bales. Most trailers illustrated in this document have 12.2 metre (40 foot) decks. Longer trailers and trailers with part loads will have different loading patterns and may require additional restraint in some cases.

1.1 LOAD COVERING

Cotton bale are to be carried on either curtain side or flat top trailers with heavy duty tarpaulins, with the following exceptions:

- a.) Short haul loads (less than 150km) can be covered with the lighter shade-cloth material, but only where the receiving merchant has provided written consent stipulating both the origin ginyard and destination warehouse.
- b.) Local loads (less than 50km) do not require any load covering during dry weather, but only where the receiving merchant has provided written consent stipulating both origin ginyard and destination warehouse.

1.2 LOADING PATTERNS

The suggested loading patterns are based on the experience of transport operators and the results of stability tests on cotton bales. Alternative loading patterns may be introduced in the future, following further evaluation.

Cotton bales can be unstable and difficult to adequately restrain if loaded incorrectly. The following loading patterns provide adequate stability in the sideways direction, but require front and rear loading racks to prevent the lower tier (unstable) bales toppling forward or rearwards.

The top tier(s) of bales should be placed so that they distribute the downward force from the webbing straps onto all of the lower bales.

The following examples illustrate most loading combinations. The loading pattern should take into account the variations in trailer size, payload and axle loading.

Example (a)(i): High Density Bales on Open Side Semi-trailer

The first tier comprises three rows of bales placed upright across the deck (see Figure 1.)

The second tier comprises two rows of bales placed on their side on top of the first tier. The two front and the two rearmost bales are laid flat for increased safety when loading and unloading.

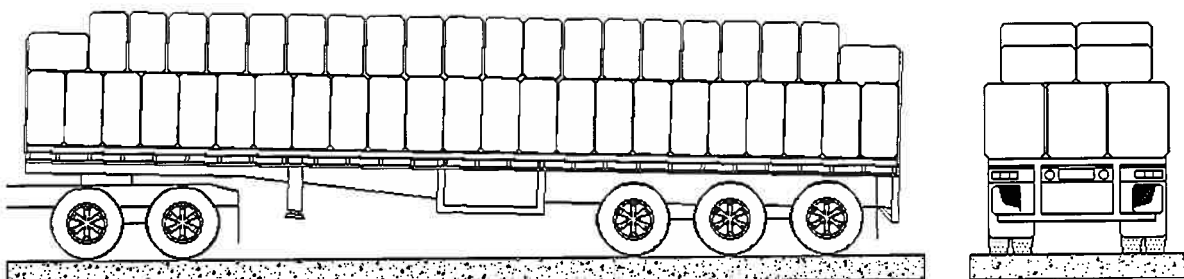


Figure 1 (High Density Bales)

Example (a)(ii): High Density Bales on Open Side Semi-trailer

The first tier comprises three rows of bales placed upright across the deck (see Figure 2)

The second tier comprises two rows of bales placed on their side on top of the first tier. There is no need to lay the front and rearmost bales flat if the gates (front and rear) extend to a minimum of 50% of the height of the top row.

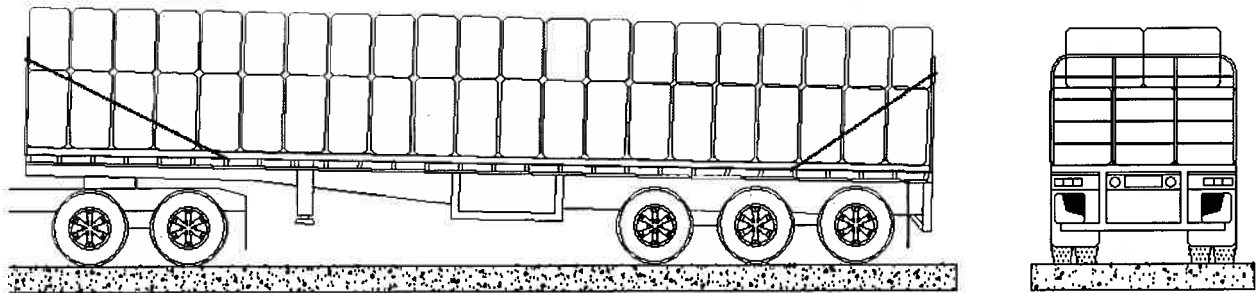


Figure 2 (High Density Bales with High Gates)

Example (a)(iii): High Density Bales on Open Side Semi-trailer

The first tier comprises three rows of bales placed upright across the deck (see Figure 3).

The second tier comprises two rows of bales placed on their side on top of the first tier in two sections positioned to comply with determined by axle loading regulations. The front and rearmost bales of each section are laid flat.

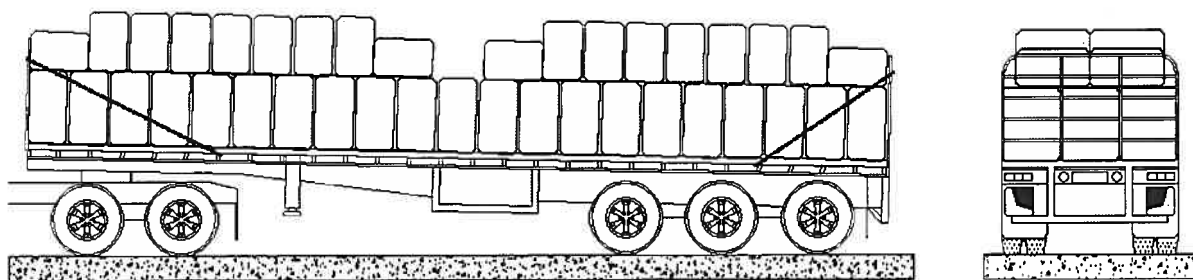


Figure 3 (High Density Bales – Top Tier Gap)

Example (a) (iv): High Density Bales on Open Side Semi-trailer

The first tier comprises three rows of bales placed upright across the deck (see Figure 4).

The second tier comprises two rows of bales placed on their side on top of the first tier in two sections positioned to comply with axle loading regulations. The additional bales are placed on their side along the centreline of the vehicle to block the rear section of bales in the forward direction.

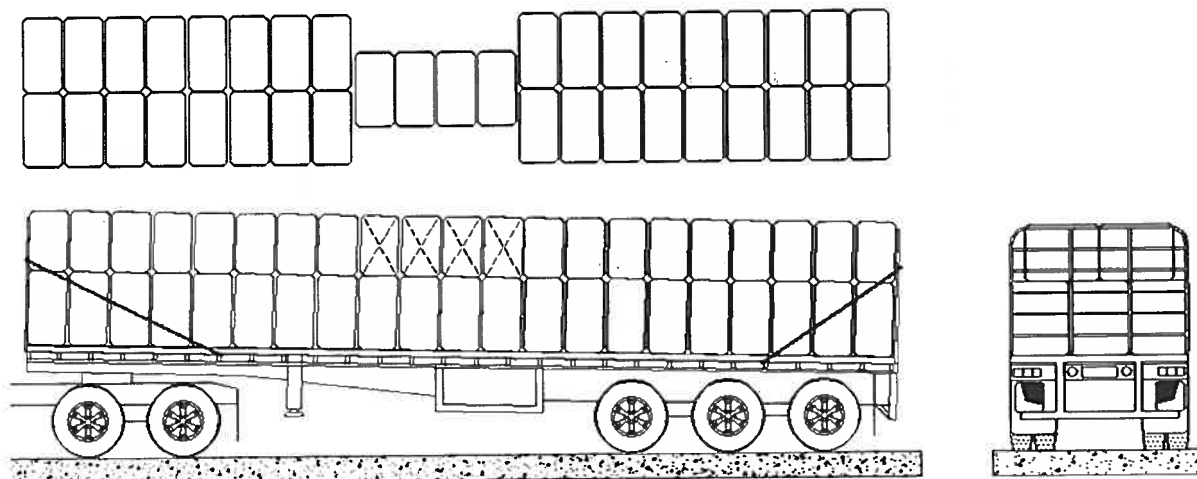


Figure 4 (High Density Bales – Top Tier Centre Loading)

Example (b)(i): High Density Bales on a Curtain-sided Trailer

The first tier comprises three rows of bales placed upright across the deck (see Figure 5.)

The second tier comprises two rows of bales placed on their side on top of the first tier. The two front and the two rearmost bales are laid flat for ease of strapping.

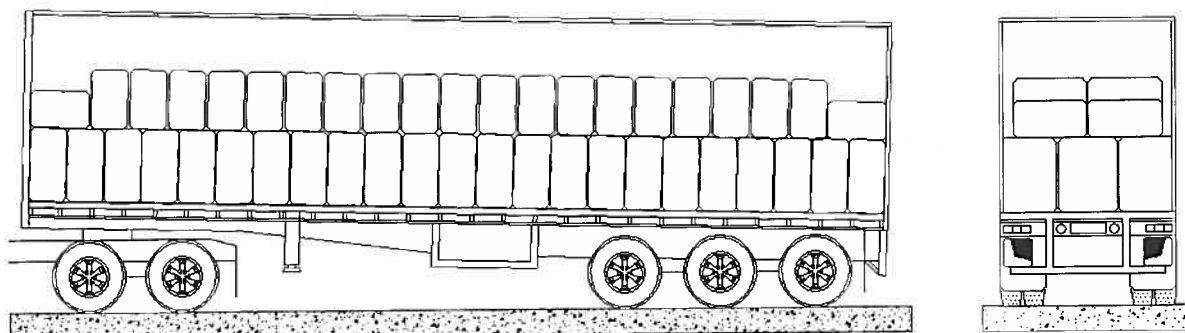


Figure 5 (High Density Bales – Curtain Sides)

Example (b)(ii): High Density Bales on a Curtain-sided Trailer

The first tier comprises three rows of bales placed upright across the deck (see Figure 6).

The second tier comprises two rows of bales placed on their side on top of the first tier in two sections positioned to comply with determined by axle loading regulations. The front bales of the rear section and rearmost bales of the front section are laid flat.

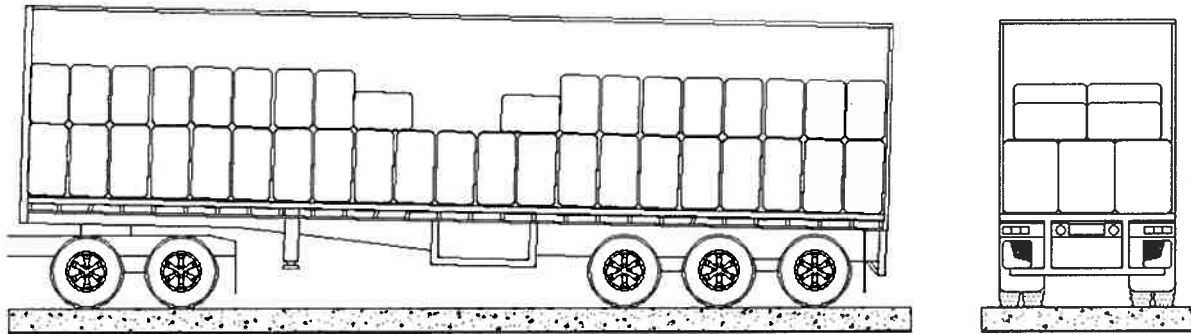


Figure 6 (High Density Bales – Top Tier Gap - Curtain Sides)

Example (c)(i): High Density Bales on Long Trailer

Where long trailers are used, or partial loads are carried, all bales in the lower tier should be at least partially covered by bales in the second tier. Substituting two rows of bales laid flat, lengthwise (see Figure 7.) modifies the top tier pattern of Figure 1.

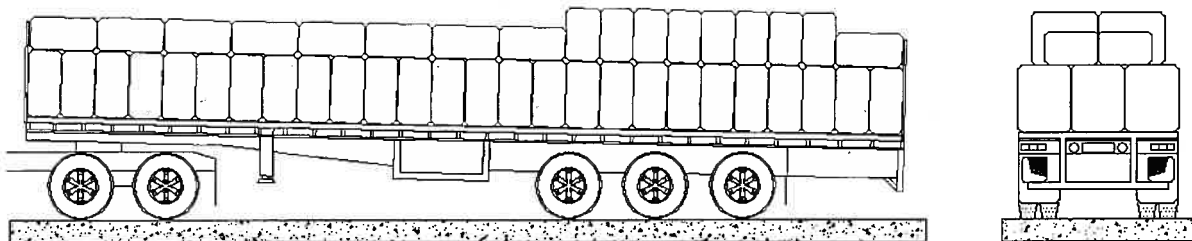


Figure 7 (High Density Bales – Long Trailer)

Example (c)(ii): High Density Bales on Long Trailer

The first tier comprises three rows of bales placed upright across the deck (see Figure 8).

The second tier comprises two rows of bales placed on their side on top of the first tier in two sections positioned to comply with determined by axle loading regulations. The front and rearmost bales of each section are laid flat.

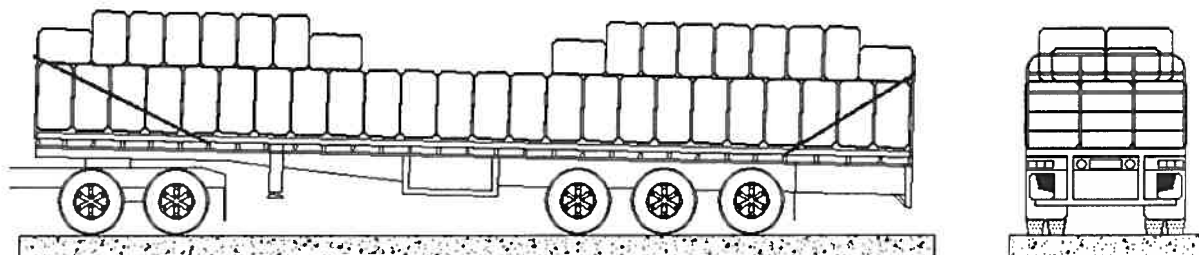


Figure 8 (High Density Bales – Top Tier Gap)

Example (c-iii): High Density Bales on Long Trailer

The first tier comprises three rows of bales placed upright across the deck (see Figure 9).

The second tier comprises two rows of bales placed on their side on top of the first tier in two sections positioned to comply with axle loading regulations. The additional bales are placed on their side along the centreline of the vehicle to block the rear section of bales in the forward direction.

The front and rear load racks must be high enough to reach at least half way up the top tier bale. If not, the front and rearmost bales must be laid flat.

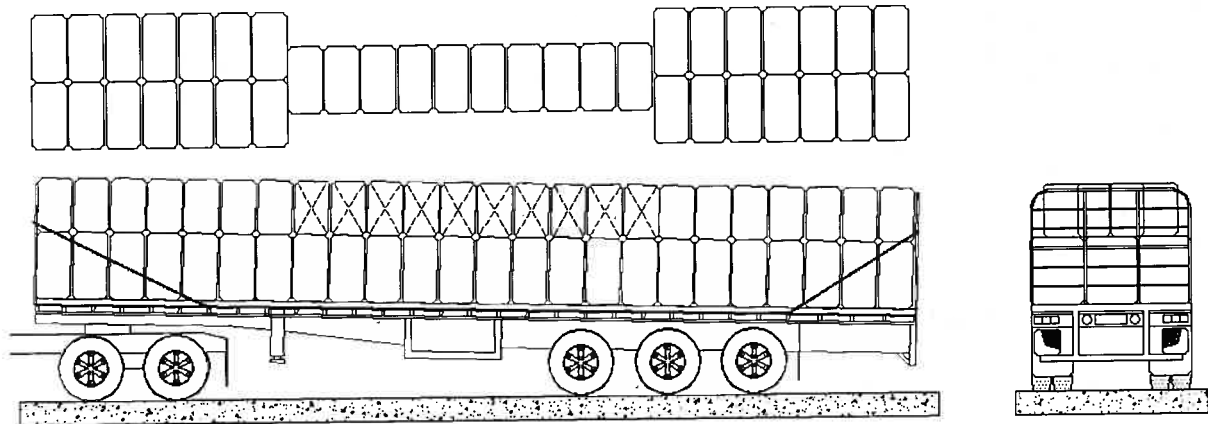


Figure 9 (High Density Bales – Top Tier Centre Loading)

Example (d)(i): Large (UD) Bales on Open Semi-trailer

The first tier comprises three rows of bales placed upright across the deck (see Figure 10).

The second tier comprises two rows of bales laid flat on top of the first tier. The bales along one side of the trailer are placed lengthwise and the bales on the other side of the trailer are placed sideways. The third tier is the same loading pattern as the second tier.

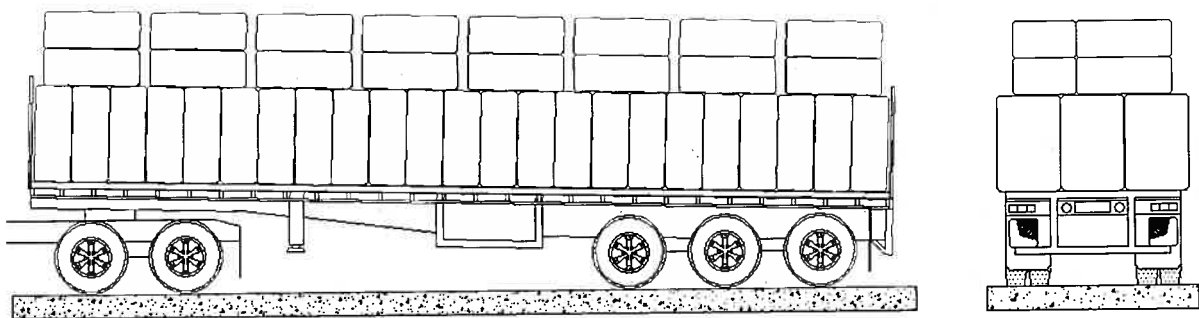


Figure 10 (Large Bales)

Example (d)(ii): Large (UD) Bales on Open Semi-trailer

The first tier comprises three rows of bales placed upright across the deck (see Figure 11).

The second tier comprises two rows of bales placed on their side on top of the first tier. The two front and the two rearmost bales are laid flat for increased safety when loading and unloading.

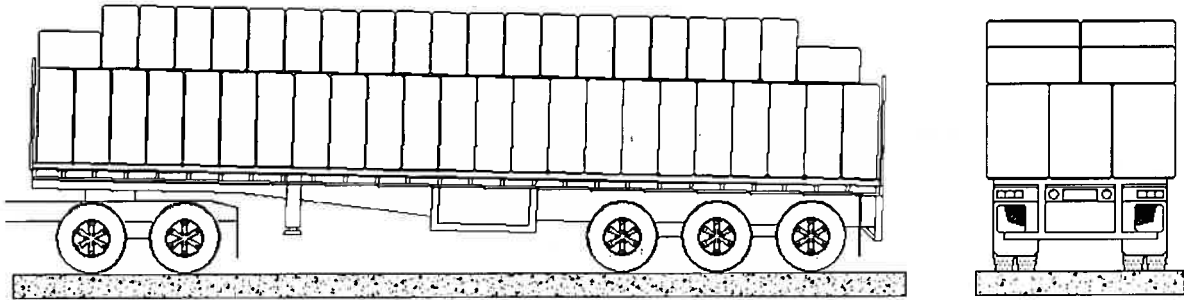


Figure 11 (Large Bales)

Example (e) Large (UD) Bales on Curtain-sided Trailer

The first tier comprises three rows of bales placed upright across the deck (see Figure 12).

The second tier comprises two rows of bales laid flat on the top of the first tier. The bales along one side of the trailer are placed lengthwise and the bales on the other side of the trailer are placed sideways. The third tier is the same loading pattern as the second tier.

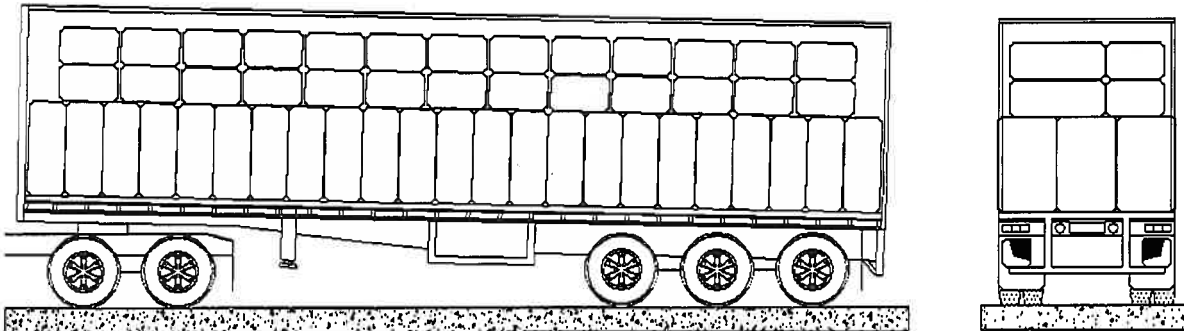


Figure 12 (Large Bales – Curtain Sides)

Example (f): Large Bales on Long Trailer

Where longer trailers are used, or partial loads are carried, all bales in the lower tier should be at least partially covered by bales in the second tier, which can be placed lengthwise, sideways or both. The top tier is one row of bales laid flat, lengthwise (see Figure 13.)

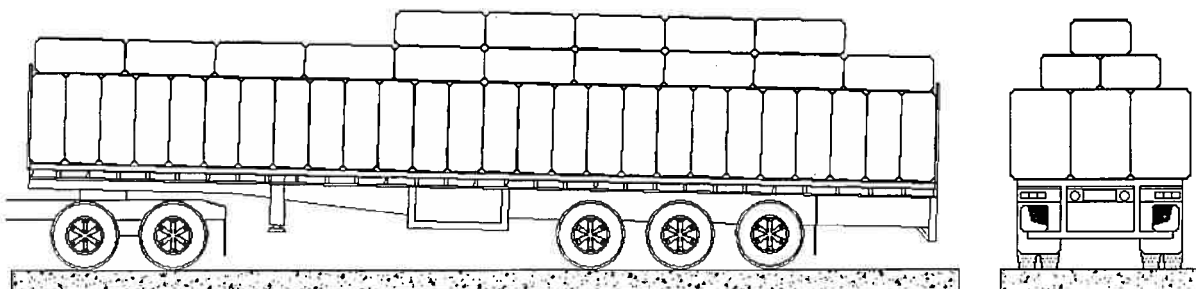


Figure 13 (Large Bales – Long Trailer)

1.3 RESTRAINING THE LOAD FORWARDS AND REARWARDS

Gates (loading racks) must be used front and rear. The gates should be braced using either chain only (see Figure 14). Webbing straps are not suitable and **ropes are not strong enough** for this application.

The lashings should be attached to or wrapped around (chains only) the outer uprights of the gate at least 1200mm above the loading deck and attached to tie rail support points at least 2 metres back from the front gate (for front gate bracing) or 1200mm forward of the rear gate (for rear gate bracing).

Chains should be clean, plated 8mm Transport Chain with a minimum Lashing Capacity of 3800 kilograms force.

A single 9 metre long chain wrapped around each of the gate uprights (and strung across the face of the gate) should be used. Alternatively two single chains could be used, attached to the uprights using certified fittings on each side.

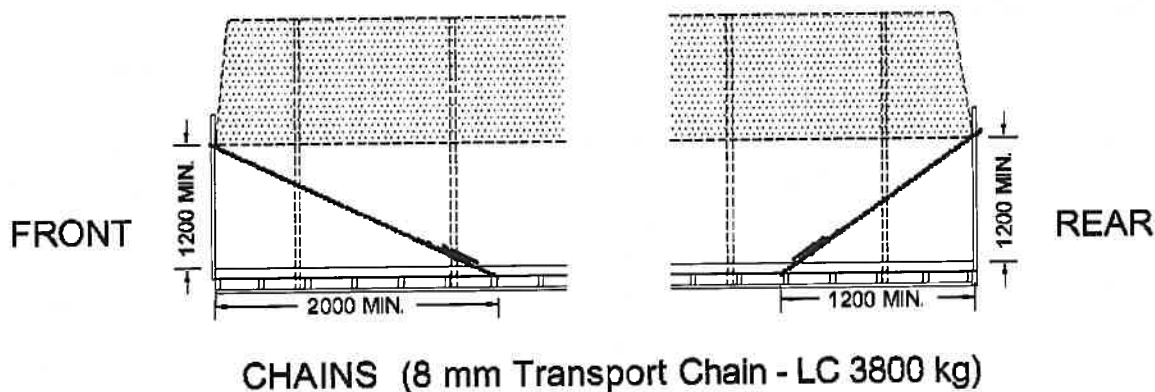


Figure 14 (Bracing Chains)

1.3 RESTRAINING THE LOAD SIDEWAYS

The sideways restraint of cotton bales requires the use of multiple webbing straps. **Ropes are not strong enough** and should only be used for securing the tarpaulins.

Curtain sides alone are not suitable for restraining full loads of cotton bales.

Webbing straps should have a minimum 2,000kg Lashing Capacity and have full tension (a minimum of 300 kilograms force), using hand ratchets or truck mounted winches. In order to ensure adequate tie down force (pre-tension) in the webbing, ensure that the spool of webbing on the hand ratchet spindle (or truck winch) is as small as possible so as to obtain the maximum mechanical advantage.

The top and bottom tiers of bales can be effectively restrained sideways by a combination of a cap tarpaulin and webbing straps over the load. Webbing straps should be placed evenly along the load, positioned to provide the required additional downward clamping force on all of the lower bales.

There should be a minimum of one strap for every three bales placed along the bottom tier of the load. For example if there are 23 rows of three on the trailer deck, a minimum of eight straps are required over the entire load.

Adequate load restraint requires that the straps maintain a minimum pre-tension. All straps must be re-tensioned within at least 5 kilometres of the start of a journey and as many times as is necessary during the journey to maintain adequate pre-tension. Where possible, curtain-sided trailers should be driven within the loading area to settle the load and the straps re-tensioned, before commencing a journey.

Example (g)(i): High Density Bales on Semi-trailer

Secure the cap tarpaulin over the top two tiers of bales, and secure a curtain tarpaulin.

Apply eight webbing straps as illustrated below in Figure 15 (*Rear gate omitted from end view*).

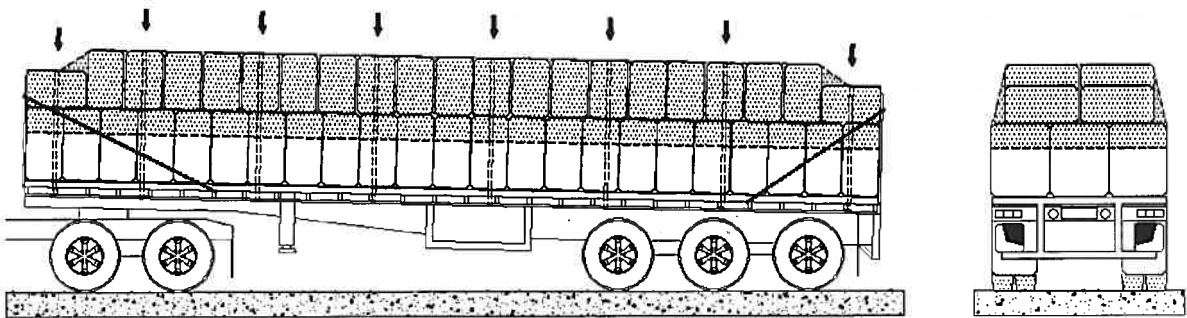


Figure 15 – High Density Bales (Open Side Trailer)

Example (g)(ii): High Density Bales on Semi-trailer

Where no horizontal strap is used on the top tier, every bale on the upper tier must be restrained with a tie-down strap. Every bale on the lower tier that is not supporting a top tier bale must be tied down.

Apply one webbing strap over each pair of upper tier bales and each three lower tier bales, as illustrated below in Figure 16.

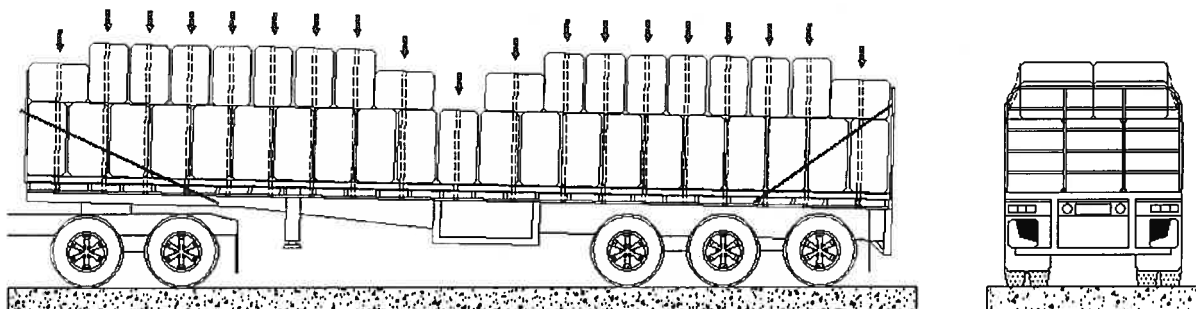


Figure 16 (High Density Bales – Top Tier Gap - No Horizontal Straps)

Example (g)(iii): High Density Bales on Semi-trailer

Where no horizontal straps are used on the top tier, every bale on the upper tier must be positively restrained. If the top tier bales are unitised into multiple packs using synthetic or webbing strapping fewer tie-down straps are required.

The illustration (Figure 17) below, shows top tier bales being restrained sideways using rigid angle over sets groups of three bales along the trailer.

Apply one webbing strap over each pair of angles and over each pair of upper tier bales not restrained by the angles as illustrated below in Figure 17.

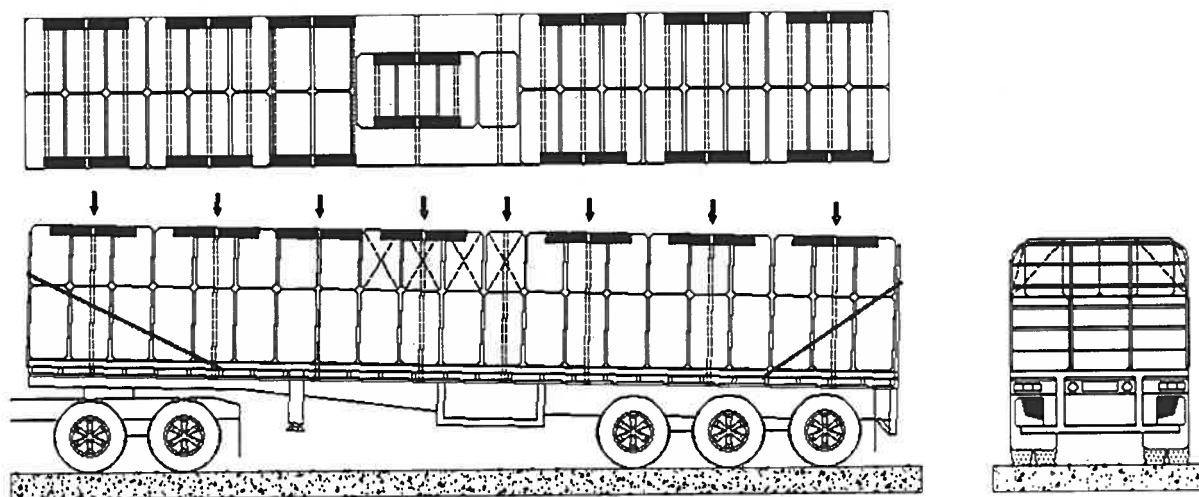


FIG. 17 (High Density Bales – Top Centre Loading)

Example (g)(iv): High Density Bales in Curtain-sided Semi-trailer

Where no horizontal straps are used on the top tier, every bale on the upper tier must be positively restrained. Every bale on the lower tier that is not supporting a top tier bale must be tied down.

Apply one webbing strap over each pair of upper tier bales and over each three lower tier bales, as illustrated below in Figure 18.

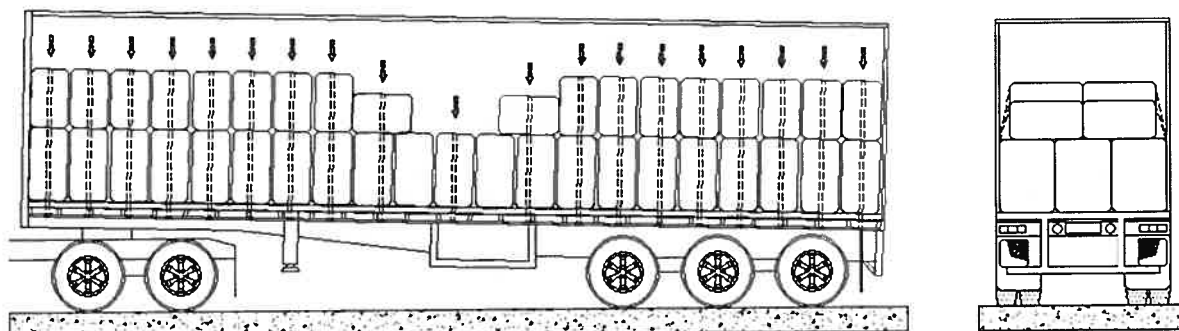


Figure 18 (High Density Bales – Curtain Sides - No Horizontal Straps)

Example (h)(i) High Density Bales on Long Semi-trailer

Secure the cap tarpaulin over the top two tiers of bales and secure a curtain tarpaulin.

Apply one webbing strap over two of every four sideways bales. Apply one strap over every pair of lengthwise bales, as illustrated below in Figure 19.

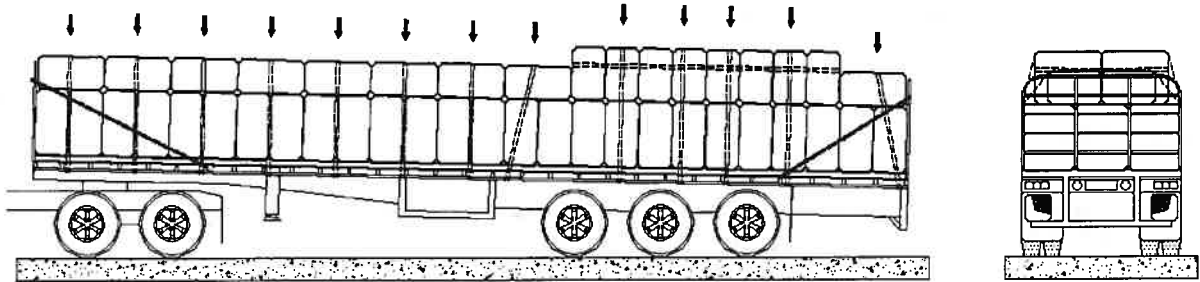


Figure 19 – High Density Bales on Long Semi-trailer

Example (h)(ii) High Density Bales on Long Semi-trailer

Where no horizontal strap is used on the top tier, every bale on the upper tier must be restrained with a tie-down strap.

Every bale on the lower tier that is not supporting a top tier bale must be tied down (See Figure 20).

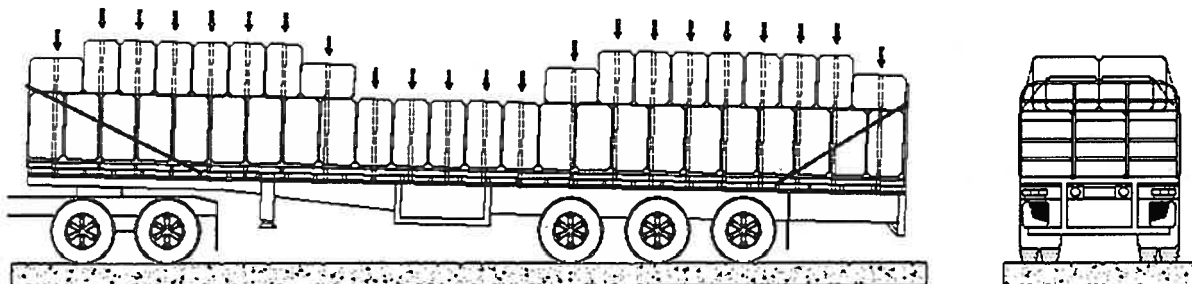


Figure 20 (High Density Bales – Top Tier Gap - No Horizontal Straps)

Example (h-iii): High Density Bales on Long Semi-trailer

Where no horizontal straps are used on the top tier, every bale on the upper tier must be positively restrained. If the top tier bales are unitised into multiple packs using synthetic or webbing strapping fewer tie-down straps are required.

The illustration (Figure 21) below, shows top tier bales being restrained sideways using rigid angle over groups of three bales along the trailer.

Apply one webbing strap over each pair of angles and over each pair of upper tier bales not restrained by the angles as illustrated below in Figure 21.

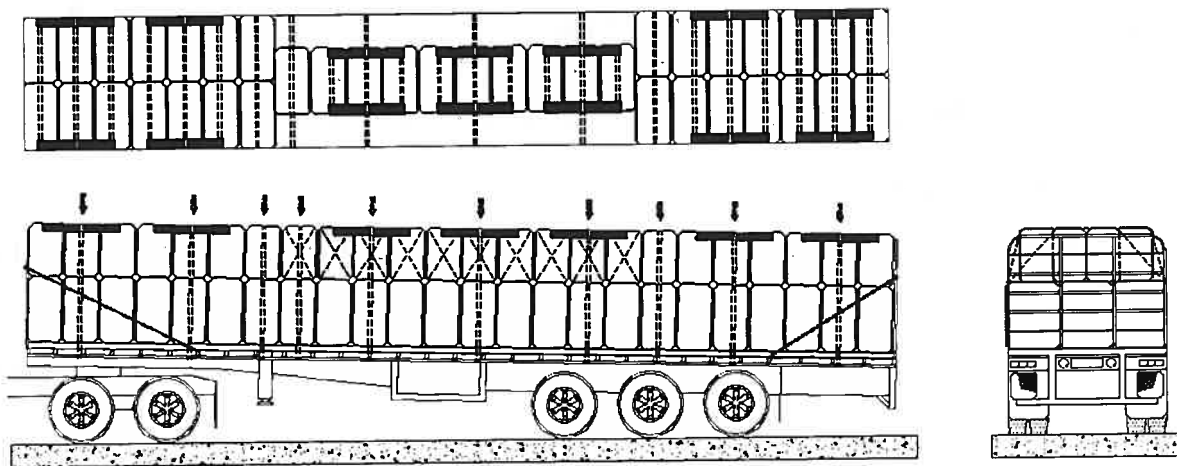


Figure 21 (High Density Bales – Top Centre Loading)

Example (i): Large Bales on Semi Trailer

Secure a cap tarpaulin over the top two tiers of bales and secure a curtain tarpaulin.

Apply eight webbing straps as illustrated below in Figure 22 (Rear gate omitted from end view).

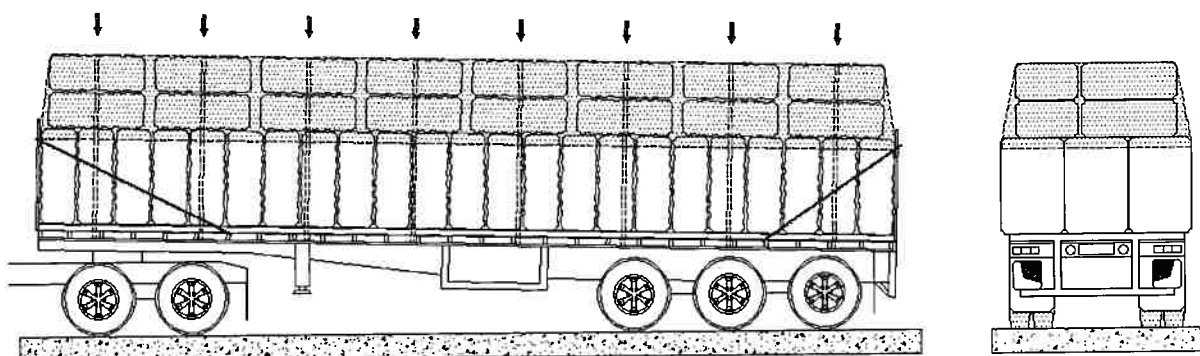


Figure 22 – Large (UD) Bales

Example (j): Large Bales on Curtain Side Trailer

The side curtains alone cannot provide the required load restraint to prevent load shift.

Apply one webbing strap over every pair of sideways facing bales, as illustrated below in Figure 23.

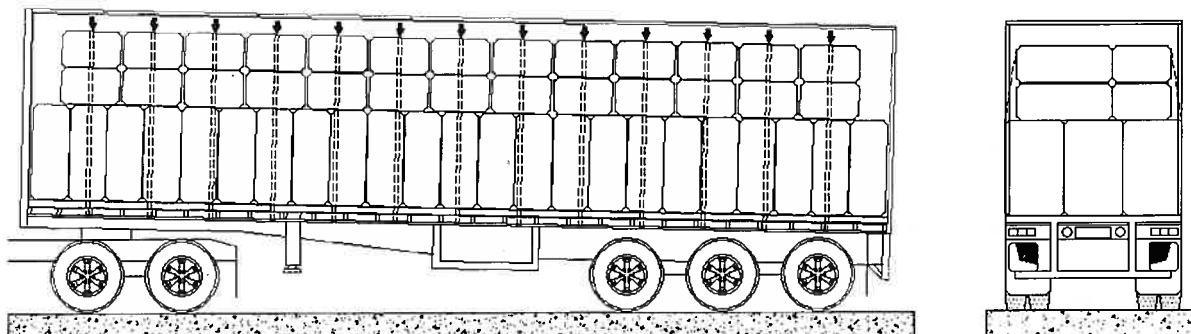


Figure 23 – Large (UD) Bales – Curtain Sides

Example (k): Large Bales on Long Trailer

Apply one webbing strap over the load for each lengthwise facing bale on the second tier, as illustrated below in Figure 24. For loads where the second tier also contains sideways facing bales, additional straps are required so that all bales on the top two tiers are strapped.

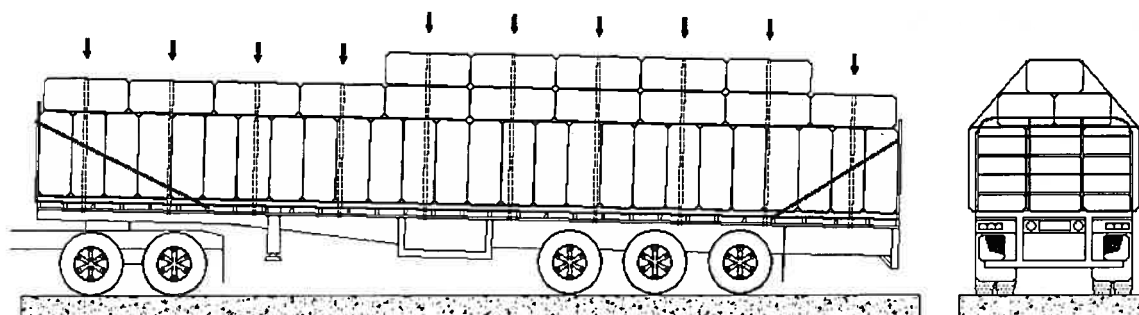


Figure 24 – Large (UD) Bales – Long Trailer

1.2 Mezzanine Floor Trailers

Mezzanine floors must be lowered to the deck of the trailer and bales loaded according to the previous examples.

If the mezzanine floor is not able to be adjusted, bales must not be loaded onto the mezzanine. It is the responsibility of the truck driver to have floors lowered prior to loading (see Figure 25 below).

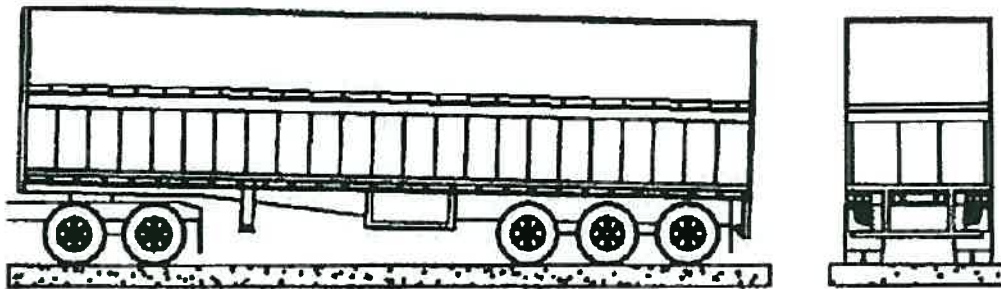


Figure 25 – Mezzanine Floor Trailers

1.3 Occupational Health and Safety Policies for Loading and Unloading

Drivers are to remain in their cab, or in the designated space during loading and unloading. This is in accordance with Ginning and Post Farm Gate Best Management Practice requirements.

For Curtain-sided trailers, the truck driver is responsible for opening and closing curtains at the instruction of the loader driver. The loader driver must cease operations while curtains are being slid open and closed.

Due to limited gap between the top of the second tier of bales and the bottom of the Tautliner roof, adequate equipment must be provided by the gin site (forklift cage or suitable platform ladder) to allow the truck driver to safely apply straps to the load.

LEGISLATION

Uniform National legislation has been in place at least since 1996 in most States of Australia. The minimum required load restraint performance standards are outlined in the “Load Restraint Guide” (published by the Australian Government Publishing Service on 12 December 1994, and updated in 2004 by the National Transport Commission.)

Details can be found at the National Transport Commission site below:

<http://www.ntc.gov.au/viewpage.aspx?documentid=00862>

NEW SOUTH WALES LOAD RESTRAINT LEGISLATION

The following regulations relate specifically to load restraint in New South Wales:

- MOTOR TRAFFIC REGULATIONS 1935 – SECT 118A
- ROAD TRANSPORT (MASS, LOADING AND ACCESS) REGULATION 1996 – SECT 35

- ROADS AND TRAFFIC LEGISLATION AMENDMENT (LOAD RESTRAINT) ACT 1998 – SCHEDULE 1
- ANY ADDITIONAL???

The Regulations enable prosecution for an offence of owning, driving or causing or permitting a dangerously loaded vehicle to be driven.

The penalties include imprisonment, fines of up to \$5500 for individuals, fines of up to \$11,000 for corporations and on-the-spot fines (Traffic Infringement Notices) of \$500.



AUSTRALIAN COTTON SHIPPERS ASSOCIATION

Best Management Practices for Storage and Handling

Version 2.0

Cotton Storage and Handling Best Management Practice Handbook

The post farm gate sector of the Australian cotton industry aims to handle all bales produced in Australia in accordance with Best Management Practices to ensure:

- Maximum efficiency
- Minimal risk of country damage
- World's best Occupational Health and Safety practices
- Minimal impact on environment and community

The Cotton Storage and Handling BMP Handbook aims to set out the framework required to achieve these goals.

It is envisaged that all bales marketed as Australian BMP Cotton will be handled in accordance with the current version of the Cotton Storage and Handling BMP Handbook. Warehouses and transport companies that are operational during a marketing year will be audited via a scheduled formal audit. Warehouses and transport companies that comply with requirements will be certified by Cotton Australia.

It is envisaged that in order to satisfy the requirements for a BMP Certificate, the cotton shipper will be required to demonstrate to Cotton Australia that bales (grown on BMP cotton farms) have also passed through BMP accredited facilities post farm gate, including: cotton gins; cotton classing facilities; freight companies and storage facilities.

Bale Identity and Integrity

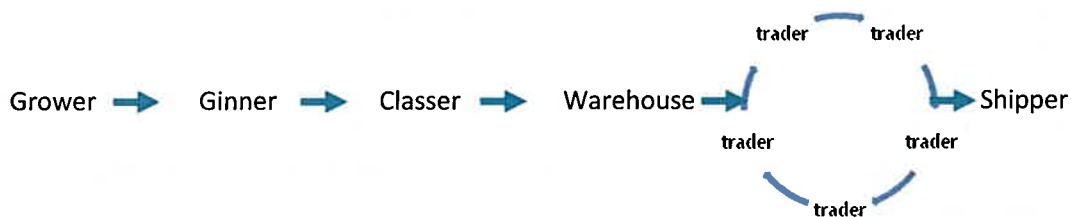
General Principle

To maintain bale integrity throughout the supply chain to provide clear information and traceability to traders and end users.

Goals

To ensure clear, efficient mechanisms for bale identification and data transfer throughout the supply chain.

To ensure “conflict free” transition of bales and bale data to the various stakeholders outlined in figure 1.



Best Management Practices for bale integrity management – Bale Tags (REFER GINNING BMP)

- ✓ Bale tag must be unique and durable. Laminates should be applied post printing to ensure durability/integrity.
- ✓ Bale tag to be placed within the top third of the bale on front and back.
- ✓ In order to identify the front of the bale from the back of the bale, the portion of the tag to be removed for classing samples is to be taken from the tag on the front of the bale, leaving the tag on the back complete. (The front of the bale is defined as the side where the top of the bale is sloped slightly downward toward the observer). Note – it is important to identify the front from the back of the bale in order to aid efficiency when stacking (see Page 9).to identify front and back of bale – to assist in turning if required for stacking into warehouse.
- ✓ Bale tag fastened to sit flat on the bale.
- ✓ Systems established to ensure identical bale tag number on each side of the bale (e.g. hourly check and log).
- ✓ NO BMP STATUS TO BE INCLUDED WITH THE ACTUAL BALE TAG ^{Note 1}

BMP Class D - Acceptable	Tag on "front of bale" secured with plastic zippy tie or wire tie ^{Note 2} . Sticker on back of bale
BMP Class C – Intermediate Standard	Tags on front and back of bale, secured with zippy tie
BMP Class B – Intermediate Standard	Tags on front and back of bale, secured with wire tie.
BMP Class A – Aspirational Target	Tags on front and back of bale secured with wire tie, with back-up tag inside the bale cover.

Best Management Practices for bale identity management – Data Transfer:

- ✓ Bale numbering must comply with industry standard nomenclature (see Appendix 1.)
- ✓ Systems implemented at the gin to ensure electronic bale data matches physical bale tags (e.g. hourly check and log).
- ✓ Reporting systems implemented (back to ginning company /bale title holder) in the event data transfer does not conform to industry standard nomenclature.
- ✓ Systems established to ensure bale numbers on title documents (packing lists) match physical bale tags (e.g. scanning into container).

Data Transfer Standards

General Principal

To ensure each participant in the supply chain receives required data for each bale in a standardised format for ease of download into individual inventory management systems.

Data Transfer Best Management Practice

Standard data transfer format is either standard excel file, or csv (comma delimited) excel file. The file should be constructed of a header line, data lines and an End-of-File line.

Header Line: This line provides the heading for the file, and titles each data element.

Data Line: A single line of data should be transmitted for each bale.

End-of-File Line: This line contains two elements of data, the first being the number of bales in the transmission, the second being the total bale lint weight in the transmission. This line provides the recipient of the file a mechanism to identify whether he/she has received the total file.

Standard Data Transfer Inclusions

<p>From Gin to Merchant / Classer</p> <p>BMP C (Minimum)</p>	<ul style="list-style-type: none"> • Compliant bale Number/Code • Bale Weight • Gin ID • Gin Run ID • Grower ID • Trading Name • Gin Date • Removal Date • Module • Module Weight • Variety • Pick Date • Field • Property • Water (Irrigated or Dryland) • Pick Method (Picked or Stripped)
<p>From Gin to Merchant/Classer</p> <p>BMP B (Target)</p>	<p>Disclosure on an industry register of the following specifications:</p> <ul style="list-style-type: none"> • Bale Size (HD/UD) • Tie Method (Plastic/Wire/Metal Strap) • Bag type (Hessian/Cotton) • Tare (kg) • Point of weighing • Moisture application technique • Farm BMP Status
<p>From Gin to Merchant / Classer</p> <p>BMP A (Aspirational)</p> <ul style="list-style-type: none"> • Additional data provided in following order: 	<ul style="list-style-type: none"> • Bale Size (HD/UD) • Tie Method (Plastic/Wire/Metal Strap) • Bag type (Hessian/Cotton) • Tare (kg) • Point of weighing • Moisture content at gin slide • Moisture application technique • Farm BMP Status

From Classer to Merchant – BMP Standard	<ul style="list-style-type: none"> • Compliant bale Number/Code • Digital Instrument length • Length (32nds) • Uniformity Index • Strength (grams per tex) • Micronaire • Short Fibre Index • Rd • +b • Colour grade • % Area (if available) • Count (if available) • Trash Grade
From Merchant to Warehouse (at first receipt) – BMP Standard	<ul style="list-style-type: none"> • Compliant bale Number/Code • Gin Name/Code • Bale Weight • Stock Allocation Code
From Warehouse to Merchant (at first receipt) – BMP Standard	<ul style="list-style-type: none"> • Compliant bale Number/Code • Freight Company (at receipt) • Vehicle Registration (at receipt) • Date Received • Humidified storage notification (if yes) • Outside storage notification (if yes)
From ACSA Merchant to ACSA Merchant – BMP Standard	<ul style="list-style-type: none"> • Compliant bale Number/Code • Grower BMP Status (Y/N/NA) • Gin Code • Class data <u>per contract requirement</u>. • Classing House

Control of Data

The above standards only apply to domestic transfer of bale title and associated data between members of the Australian Cotton Ginners Association, Australian Cotton Classers Association and Australian Cotton Shippers Association.

Care must be taken to protect local industry IP and efficiency of ginning /warehouse / handling operations – and as such, transfer of data up to and beyond the point of FOB vessel should be limited to minimum international trade practices.

Fire Bales

General Principal

To eliminate the risk of loss and/or damage to bales from fire.

Best Management Practice

- ✓ Bales identified as fire bales (and/or adjacent bales) by the origin gin and/or contracting merchant must be segregated at the receiving warehouse for a minimum of 2 days prior to general intake (in addition to isolation days at the gin yard as specified in ginning BMP).
- ✓ Bales identified by the receiving warehouse as fire bales (but not previously) notified by the gin or merchant) must be removed, and the entire incoming trailer segregated for a minimum of 7 days prior to intake into general warehouse.
- ✓ Fire bales must be identified with a tag or sticker detailing their gin date and date of receipt into store.

Loading / Stacking / Storage Standards

General Principal

1. Maintaining appropriate Occupational Health and Safety standards in accordance with State and Federal Laws.
2. Improving efficiencies in storage and handling procedures.
3. Minimising Country Damage/Contamination

Best Management Practice – Bale Loading Onto Truck

- ✓ Bales will be loaded onto trucks and restrained in accordance with the industry's Load Restraint guide and relevant road transport legislation (in New South Wales the *Roads Transport (General) Act 2005* and *Road Transport (Mass, Loading and Access) Regulation 2005*, and in Queensland the *Transport Operations (Road Use Management) Act 1995* and the *Transport Operations (Road Use Management – Mass, Dimensions and Loading Regulation 2005*).
- ✓ Bale Removal: Bales to be removed from the gin pad within 7 days of issuance of the ginning invoice to the receiving merchant.
- ✓ Bale Loading: Bales must be loaded from well drained pads free of mud and other contaminants. Concrete pads are recommended. Alternatively road base or suitable free draining, non contaminating compounds such as compacted gravel may be used. Bale pads must be large enough to accommodate bale production capacity for at least the 7 day non-demurrage, or "free" period. In the event of insufficient bale pad capacity – refer "Outside Storage of Bales"
- ✓ The bottom tier of bales are to be loaded three wide onto a flat bed trailer , with width to remain in accordance with National Transport Code requirements and/or State based exemptions granted to the cotton industry.
- ✓ Bale Ranges/Load: Bales should be loaded to avoid multiple bale ranges on trucks, which increase the risk of warehouse intake errors and lost bales.
 - Minimum BMP Standard: Average < 3 bales ranges/load.
 - Aspirational BMP Standard: Average < 2 bale ranges/load.
- ✓ Systems should be established between the gin and carrier to take bales in sequence, and reporting mechanisms implemented between receiving warehouse, carrier and origin gin if not taken in sequence. **Recommendation**: Ginners stage bales on the gin pad for load out "by receiving merchant", and in consecutive bale order.
- ✓ Reporting Mechanisms for Country Damage – the duty of care rests with the gin. Ginner to inspect the truck for grease/dirt etc, and not allow load out until satisfied.

Demonstrating Compliance and record keeping

- ❖ Records of bale ranges / trailer inspection / bale inspection on despatch docket – signed by both driver and loader operator. (See Appendix 3)

Best Management Practice – Bale Unloading Into Warehouse

- ✓ Bales will be unloaded and staged for stacking on a clean, well drained concrete pad.
- ✓ Grade A warehousing facilities will possess undercover staging points.
- ✓ Adequate communication & recording/benchmarking systems should be in place between ginners, classing organisations, merchants & receiving warehouses to ensure timely transfer of data required for warehouse allocation, thereby aiding unloading and stacking efficiency. Incorporation of KPIs concerning the comparison of gin date, classing date, despatch date (sample and bale) and receival date (sample and bale) may assist performance monitoring.
- ✓ Bale grabs are the only acceptable method of handling bales.

Best Management Practice – Bale Stacking Procedure

For the purposes of stacking, bales will be deemed BMP Compliant if they meet the Ginning BMP size and weight requirements:

- High Density (HD) bales should be between 100 and 115cm high.
- Universal Density (UD) bales should be between 130 and 145cm high)
- Both HD and UD bales should be between 50 and 60cm wide and between 80 and 90cm deep.
- All bales should be pressed and strapped so that their edges and sides are square.
- Bale net weights should not be below 150 kilograms or more than 250 kilograms.
- ✓ Bales will be stacked according to the warehouse company's and/or contracting merchant's minimum insurance guidelines.
- ✓ Every second row of bales in the stack is to be "turned" to ensure stability of the stack, i.e. – if the bottom and second bottom row in the stack have the "front" of the bale facing out, then the third row in the stack should have the "back" of the bale facing out.

Bale Stacking:

	BMP Compliant	Non BMP Compliant
High Density	Maximum 5 High	Maximum 4 High
Low Density	Maximum 4 High	Maximum 3 High

Best Management Practice – Outside Storage of Bales

Bales can be stored / staged for storage on clean, dry bale pads for a maximum 48 hours before appropriate medium term "Outside Storage" must be implemented. This consists of the following minimum standards:

- ✓ Billets of sufficient height (minimum 100mm) to be placed on a clean, sealed surface.
- ✓ Covering (e.g. Canvas tarpaulin) to be placed on top of billets
- ✓ Bales to be stacked on top of covering, which must be wrapped over the top of the stack and adequately secured.
- ✓ Weekly inspection required for moisture/vermin damage.

Demonstrating Compliance and record keeping

- ❖ Date Received
- ❖ Date Placed in outside storage
- ❖ Date Removed from outside storage
- ❖ Weekly inspection log/damage reports (See Appendix 4)

Best Management Practice – Shared Storage of Bales

- ✓ Cotton storage area must be clearly delineated and segregated from general goods as stipulated in insurance / AQIS requirements for specific goods to avoid cross contamination.
- ✓ Cotton stored in shared facilities must be inspected on a monthly basis with any cross contamination reported and remediated.
- ✓ Storage facilities must be maintained and inspected to minimise the risk of cross contamination.
- ✓ Contracting merchant must be notified of shared storage.

Best Management Practice – Country Damage Reporting

- ✓ Any evidence of country damage must be reported in writing to the contracting party/merchant within 24 hours of identification.
- ✓ All bales should be inspected monthly for signs of vermin damage and/or cross-contamination.
- ✓ Bales stored outside must be inspected weekly for vermin.

Demonstrating Compliance and record keeping

- ❖ Date of inspection
- ❖ Type of damage identified
- ❖ Photographic evidence of bale condition (See Appendix 5)

Best Management Practice – Bale Loading into Container

- ✓ Bales will be staged for loading on a clean, well drained concrete pad.
- ✓ Bale grabs are the only acceptable method of handling bales
- ✓ All AQIS standards must be met
- ✓ Cotton loaded into Cotton Quality Containers:
 - No obnoxious odours
 - No holes
 - No transferable internal rust/residues
 - No transferable floor stains
 - Clean and Dry
 - No Cargo Residue
 - No Infestation
 - Normal Wear and Tear Acceptable
- ✓ **Bale Stuffing:** Maximum number of bales according to container size (40' General Purpose / 40' High Cube) and bale dimension/shape grading.

	BMP Compliant Bale shape & size		Non BMP Compliant	
	40' GP	40' HC	40' GP	40' HC
High Density	112 bales	116 bales	110 bales	110 bales
Low Density	88 bales	100 bales	88 bales	96 bales

Bale Packaging

General Principal

To generate efficiencies and enhance value by creating a pathway toward standardised Australian bale packaging – based on customer and supply chain preferences.

Goals

To generate a communication mechanism with regards individual gin site bale packaging methodology prior to the commencement of each ginning season.

To establish pathways towards standardisation of Australian cotton bale packaging.

To ensure standard packaging across individual gin runs.

Best Management Practices – Communication Mechanism

- ✓ Ginners – For Grade B Compliance: Survey (Appendix 6) completed and lodged by ginning organisation with BMP Committee/Auditor prior to the commencement of each season.
- ✓ Ginners – For Grade A Compliance: Gin data set transfer to include:
 - Bale Cover (Hessian/Cotton)
 - Bale Ties (Plastic/Wire Tie/Metal Strap)
 - Number of Ties
 - Tare
 - Point of Weighing
- ✓ Warehouse: Monitor incoming bales to ensure physical packaging of receivables corresponds with ginners declared packaging method – and or packaging inconsistencies within gin runs.
- ✓ Warehouse: Reporting procedures back to gin / contracting merchant if packaging is not in accordance with industry bale packaging register (to be maintained by a BMP Committee comprising representatives from ACSA, ACGA and CRDC / Auditor and published pre-season in updated Cotton Storage and Handling BMP Handbook).

Best Management Practices – Pathways toward Standardisation

- ✓ Ginners: Establish a plan for progression through BMP Standards (as outlined in ginning BMP document).
- ✓ Shippers: BMP shipments must adhere to minimum bale packaging standards.

Notes

Note 1: BMP Status should not be declared on the tag, as this could short-circuit the process – allowing end user's to identify BMP status without actually “demanding” it. There is no value in the tag once the bale is stripped for the laydown.

Note 2: Wire ties are preferable to plastic zippy ties for bale fastening. Plastic zippy ties can hang over the tag reducing the efficiency of the scanning procedure.

Note 3: Taking gates on and off trailers represents a safety issue and can slow down the loading/unloading process.

Note 4: FQ2 containers are 1 below Food Quality 1

Appendix 1 – Standard Bale Numbering & Gin Codes

Ginning Company	Gin Name	Location	Bale	Gin Code	Prefix	Total Alphanumeric
Auscott	Auscott	NARRABRI	HD	AUS08	8	8
Auscott	Auscott	NARRABRI	HD	AUS09	9	8
Auscott	Auscott	MIDKIN, MOREE	HD	AUS05	5	8
Auscott	Auscott	MIDKIN	HD	AUS06	6	8
Auscott	Auscott	WARREN	HD	AUS07	7	8
Auscott	Auscott	TRANGIE	HD	AUS10	1	8
Brighann Ginning	Brighann	MOREE	HD	BG01	BG	8
Carroll Cotton	Carroll Cotton	CARROLL	HD	CC	CC	8
Evbe Agribusiness	Boring Sugar Ginnery	BORING	HD	SA01	SA	8
Dunavant	Dunavant	MOREE	HD	DVT01	20	8
Dunavant	Dunavant	EMERALD	HD	DVT02	21	8
Dunavant	Dunavant	DALBY	HD	DVT03	22	8
Keramba	Keramba	MOREE	UD	KOR01	KR	8
Namoi	Merah North	MERAH NORTH	HD	NAM02	N	8
Namoi	Yarraman 4	YARRAMAN	HD	NAM04	N	8
Namoi	Yarraman 6	YARRAMAN	HD	NAM06	N	8
Namoi	Moomin	MERRYWINEBONE	HD	NAM08	N	8
Namoi	Boggabri I	BOGGABRI	HD	NAM13	N	8
Namoi	Boggabri II	BOGGABRI	HD	NAM14	N	8
Namoi	Trangie	TRANGIE	HD	NAM15	N	8
Namoi	Mungindi	MUNGINDI	HD	NAM12	N	8
Namoi	Macintyre I	GOONDIWINDI	HD	NAM01	N	8
Namoi	Macintyre II	GOONDIWINDI	HD	NAM11	N	8
Namoi/Australian Food & Fit Ashley Ginning Services	ASHLEY	ASHLEY	HD	NAM07	N	8
Namoi/Sundown Pastoral Co Wathogor Ginning Company	MOREE	MOREE	HD	NAM09	N	8
Namoi/Twynam Australian Cotton Ginning Com	HILLSTON	HILLSTON	HD	NAM17	N	8
North Bourke Cotton Growers	North Bourke	BORKE	UD	NB01	NB	8
North West Ginning	North West Ginning	MOREE	HD	NW01	NW	8
Qld Cotton	Qld Cotton	COLLYMONGLE	HD	6140	30	8
Qld Cotton	Qld Cotton	WEE WAA	HD	6060	6	7
Qld Cotton	Qld Cotton	ST GEORGE	HD	6030	3	7
Qld Cotton	Qld Cotton	DIRRRANBANDI	HD	6070	0	7
Qld Cotton	Qld Cotton	BEARDMORE	HD	6100	5	7
Qld Cotton	Qld Cotton	EMERALD	UD	6040	4	7
Qld Cotton	Qld Cotton	MOURA	HD	6090	M	7
Qld Cotton	Qld Cotton	CECIL PLAINS	UD	6020	2	7
Qld Cotton	Qld Cotton	DALBY	HD	6050	5	7
Qld Cotton	Qld Cotton	WARREN	UD	6160	60	8
RMI Pty Ltd	RMI Carrington Cotton	GOONDIWINDI	HD	RM101	RM	8
Tandou Ltd	Tandou Ltd	BROKEN HILL	UD	TAN01	TL	8

Appendix 2 – Gin Packaging Register & Contact Details

TO BE COMPLETED



Appendix 3 – Sample Bale Despatch Docket

7101



AUSCOTT MARKETING PTY LIMITED

129256

ACN 002 970 667

GINNED BALES MANIFEST

Deliver to: AWH Sydney

Gross:	42040	kg	
Tare:	21480	kg	
Net:	20560	kg	

Split Weight 1

Merchant: Cargill Cotton

BALE RANGES	TOTAL BALES
50410922 to 50411071	150
150	
Trailer Condition (Clean & Dry):	Y/N
Bale Condition (Sound):	Y/N

TERMS & CONDITIONS

I, the driver, accept the bales as detailed on the manifest above on the following terms and conditions:

- 1 I acknowledge that the bales were received in good order and condition and without damage. Alternatively, any damage to the bales has been brought to the attention of, noted in writing below and signed by the loader driver or an agent of Auscott Marketing Pty Limited (AMPL) with one copy of such writing being retained by the agent of AMPL and one copy being retained by me.
- 2 I undertake to completely cover my load to protect the bales from damage by water, dirt, sparks, fumes, etc. Further, I am aware that cotton is a highly flammable product and I agree not to permit smoking, sparks or naked flames in the vicinity of the cotton bales whilst same are in my possession.
- 3 I am responsible for the safe delivery of the bales and for any loss or damage occurring whilst bales are in my possession, I will compensate Auscott Marketing in the case of any loss or damage caused by my negligence.
- 4 Any bales which are damaged at time of delivery will be deemed to have been damaged whilst in my possession unless such damage had been identified in terms of Clause 1.
- 5 I undertake to deliver this load within 2 working days of the date of this manifest.

Agreed By:

STEVE

Driver's Name (If BALE PRINT)

[Signature]

Driver's Signature

MURRAY TRENDS

Name of Transport Company

Date

29/04/2009

Rego:

NV32FX

Appendix 4 – Outside Storage Record Form

Bale Range:

Date Placed in Outside Storage:

Date Removed from Outside Storage:

Inspection Number	Vermin Damage	Moisture Damage	Other Damage	Billet Condition	Tarp Condition
Week 1					
Week 2					
Week 3					
Week 4					

Appendix 5 – Sample Storage Inspection Log

Lot/Stack Number	Date of Inspection	Undercover / Outside	Vermin Damage	Moisture Damage	Cross Contamination	Cover Condition

Appendix 6 – Gin Disclosure

Prior to the commencement of each season, the Post Farm Gate BMP committee will survey ginning organisations to compile information according to the following:

Gin Name: _____

Gin Code: _____

Bale Prefix: _____

Bale Covering: Hessian / Cotton / Other (please specify)

Bale Ties: Plastic Straps / Wire Ties / Metal Straps

Number of Ties: _____

Tare: _____

Point of Weighing: Pre Bagging / Post Bagging

Bale Size: UD / HD