

Moisture management a must

High seed cotton moisture levels can reduce the 'ginability' of seed cotton, are directly linked to lower colour grades and can cost growers hundreds of dollars per hectare in discounts. Excessive drying causing fibre damage and high seed cotton moisture is often associated with high trash content.

Higher moisture levels are directly linked to lower colour grades and can also mean that excessive drying is needed, which causes fibre damage. High seed cotton moisture is also often associated with high trash content.

In general the Cotton Ginners Association considers seed cotton moisture levels between six percent and 10 percent as ideal, 11 to 12 percent as marginal and above 12 percent as excessive. Given an extended storage timeframe in the field or gin yard the lower the seed cotton moisture the better results the grower will receive from their farm.

Picking cotton with high moisture can also result in poor performance and damage of machinery or timely delays.

Cotton picked wet will result in lint becoming twisted on the spindle of the harvester which may lead to seed cotton being more difficult to process in the gin. The harvesting operation itself is also interrupted as picker doors are blocked more often when cotton is too moist and efficiency declines as a result of poor doffing efficiency. Doffers and moisture pads on pickers can also be damaged.

Those who see first-hand the effects of high moisture on fibre are the people past the farm gate. The issue of moisture is most often viewed in terms of its effect on fibre quality and thus marketability. However, the issue can also hit growers squarely in the hip pocket, according to figures presented by Andrew at the Field to Fabric. These figures showed the average discount costs can total \$320 per hectare for seed cotton moisture content equal or greater than 12 percent (Table 1).

Fibre quality is integral to the success and sustainability of Australian cotton. Harvesting crop to produce seed cotton with high moisture can undo a lot of good management undertaken during the growing season.

"If you make the decision to pick wet cotton be sure to understand that the quality may not be the same," Australian Cotton Shippers' board member Phil Sloan says.

"However, if you make a decision to pick when moisture is high, make sure this information is conveyed to the gin so they can deal with it appropriately.

"Picking wet cotton is something that in 99 percent of situations can be avoided, so planning and good management is key.

"All of industry understands the need to get the crop off in good time, but sacrificing quality for high moisture levels affects the industry at every level.

"Our overseas customers value us for our ability to consistently produce high quality cotton, so from a merchant's point of view it is vital we manage our harvest according to

the research that has shown the effects of high moisture on fibre quality.”

Wet cotton processed into a module in the field will also increase the risk of the module self-combusting or lowering the grade due to yellowing or spotting associated with fungal contamination. High moisture content is usually caused from picking in unsuitable conditions, or modules/round bales being exposed to moisture while in storage or in the field. Good harvest management is the cornerstone in avoiding high moisture and a clean, high quality harvest by monitoring weather conditions.

Moisture and weather play

Moisture monitoring needs to be more frequent at the beginning and end of each day as the change in moisture can be quite abrupt. If cotton is picked moist ginning results suffer. Therefore, time of day and prevailing weather conditions must be monitored and taken into consideration.

From a ginner’s perspective, higher moisture also means higher energy use and longer processing time, which no one wants. High moisture is also often associated with higher trash content.

Round modules

Ginners and researchers, who picked with the new John Deere 7760 picker, have noted higher moisture levels in round modules. This has been attributed to operators now picking longer into the evening as the labour requirement has been so dramatically reduced in comparison to using older style harvesters, module builders and so on.

About 35 percent of the 2010-2011 crops were picked with the JD 7760, then in 2011-12 this grew to approximately 60 percent with around 228 pickers in the field. This season more than 300 machines will take to the fields.

The *Australian Cotton Production Manual* outlines some other characteristics of round modules, which further highlight the need for diligent monitoring of seed cotton moisture. Round modules are smaller in size (four to 4.2 bales) when compared to the traditional 36 or 40-foot module (22 to 28 bales). This means that there will be less dilution of the cotton from across different picking times and moistures. The last round module picked each night will have significantly higher moisture than those picked in the middle of the day. From a ginner’s perspective this is an issue as they are unable to respond to rapidly changing moisture levels to gin efficiently.

Round modules are twice as dense as conventional modules. The increased density, as well as the plastic covering the module, reduces the rate of moisture transfer to the atmosphere.

Round modules clumped tight in sausage formation will also limit airflow between modules. Isolation for express ginning of high moisture round modules can also be difficult, as they can be lost in the multitude of modules produced in a shift. Cartage of several (five

to six) round modules can also make isolation of these modules at the gin difficult.

Increased communication

Increased communication between farm managers and the gin is another step to avoiding the problems associated with high moisture. Notifying the ginner that there are modules that maybe moist so that they may be ginned first, or at least monitored in the module yard is good practice.

Keep good module records

Identifying when and where each module is produced on a farm can help with producing better fibre quality outcomes as the grower can discuss with the ginner the quality of the cotton of each module and thus tailor the ginning process to suit. The grower can also use these records to better understand the variability that exists in their fields to refine management practices for that particular field in subsequent seasons.

Each module should have a record (with a duplicate kept in a safe place), which includes the date and weather conditions when picked. Any records or numbers assigned to modules should be as permanent as possible. Permanent marker pens should be used on cards, placed in a sealable plastic bag and attached to the module. If a module is suspected of having a contaminant, clearly identify it, and notify the gin when delivering the module of the potential problem.

Staging modules correctly can also help ginner manage moisture. Correct staging means organising modules sequentially in-field and ensuring they are tagged correctly so they can be delivered to the gin where they are processed sequentially.

This gives the ginner a more linear ginning pattern from dry to moist or vice versa depending on time of day picking started/stopped therefore more efficient ginning. It also allows gins to give better feedback to growers on in-field variations in yield and quality.

More information

Cotton production Manual 2012

FibrePAK

myBMP and for downloading resources such as a module information record sheet.

Harvest BMP 2013

Should we be harvesting?

Moisture considerations:

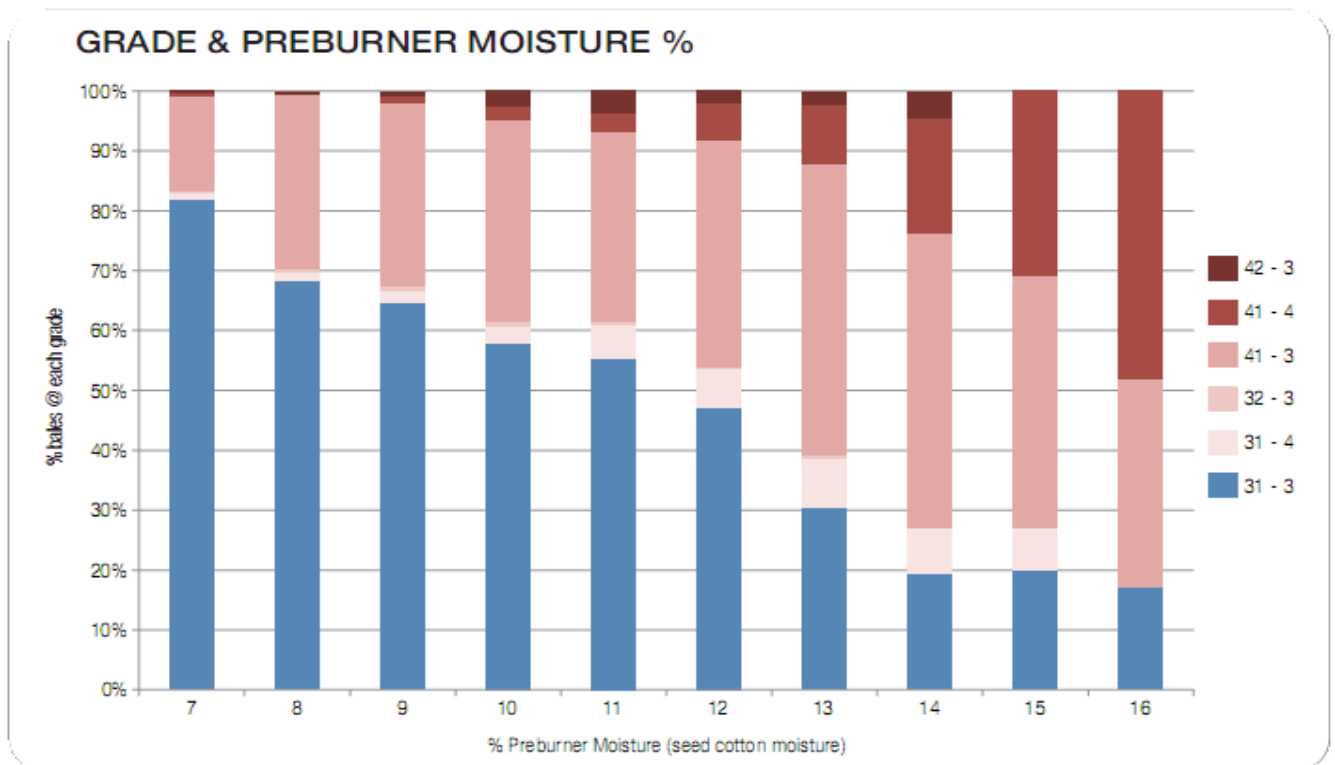
- There is no dew present and relative humidity of the air should be less than 70 per cent. If moisture is present on vehicles while harvesting it is most likely that the cotton is too wet.
- The seed should feel hard (cracks in your teeth).
- If you can feel moisture on the cotton it is too wet. Seed cotton measured on a

moisture meter should be between six and 10 per cent and no greater than 12 per cent.

- Consider that machine picking can also add two per cent moisture to seed cotton.
- A symptom of moist cotton is frequent blocked doors, which causes the picker to throw cotton out the front of the picking heads.
- If cotton is being expelled into the basket in dense blobs and is not fluffy it may be too moist.
- Suitable picking conditions late into the night are rare.

Please see the below graph:

So how much can excessive seed cotton moisture actually cost?



This graph represents approximately 13,000 bales at one gin last season with pre-burner moisture monitoring equipment. Each column represents the proportion of bales by grade at each moisture percentage. Although moisture content is not the only determinant of colour and leaf grade it is clear that high moisture content can have an additional negative impact on fibre quality.

Assuming no other penalties (i.e. base micronaire and staple) the average discount for bales from modules below 12% moisture was \$15/bale and for modules 12% and above \$33/bale. Given the industry average yield for irrigated cotton from last season (2010-11) of 9.7 bales/ha this represents an average discount cost of \$320 per hectare for seed cotton moisture content equal or greater than 12%.