



# BMR Corn

## A New Forage Variety Offering Productivity Benefits for Dairy Feeding Systems



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### Background and Purpose

Forages form the foundation of any successful dairy cow diet. Among the various forage options, corn silage is a particularly suitable choice in intensive dairy systems, especially those employing Total Mixed Ration (TMR) and Partial Mixed Ration (PMR) feeding systems, due to its ability to deliver high dry matter yields per hectare, combined with excellent nutritional quality. Brown Midrib (BMR) corn is a variety distinguished by a characteristic brownish midrib, resulting from a genetic mutation that reduces lignin content in the plants' stalk. Lignin is an indigestible component of the plant cell wall, which increases with plant maturity to stabilise the plant. BMR corn's lower lignin content means the plant is more digestible, potentially leading to better feed intake and enhancing milk production.

Most of the research on BMR corn has focused on the bm3 mutation. Although the bm3 is highly digestible, it has struggled with weaker plant structure, lower yields, and poor drought tolerance, which is a drawback in Australia's subtropical climates. Recognising these challenges, plant breeders have developed a new mutation, bm1, specifically designed to thrive in subtropical Australian environments. The bm1 BMR hybrids have been showing promising results and have been cultivated across a variety of sites in Victoria, New South Wales and Queensland, with heat resistance, disease tolerance, and strong yields, potentially making them well-suited to dairy farms in these regions.

This study presents preliminary findings from a summer 2024/25 study conducted at the Gatton Research Dairy, focusing on the agronomic and nutritional quality assessment of the new BMR corn variety (bm1- CRM 107) compared to conventional corn (variety P 17822- CRM 117).

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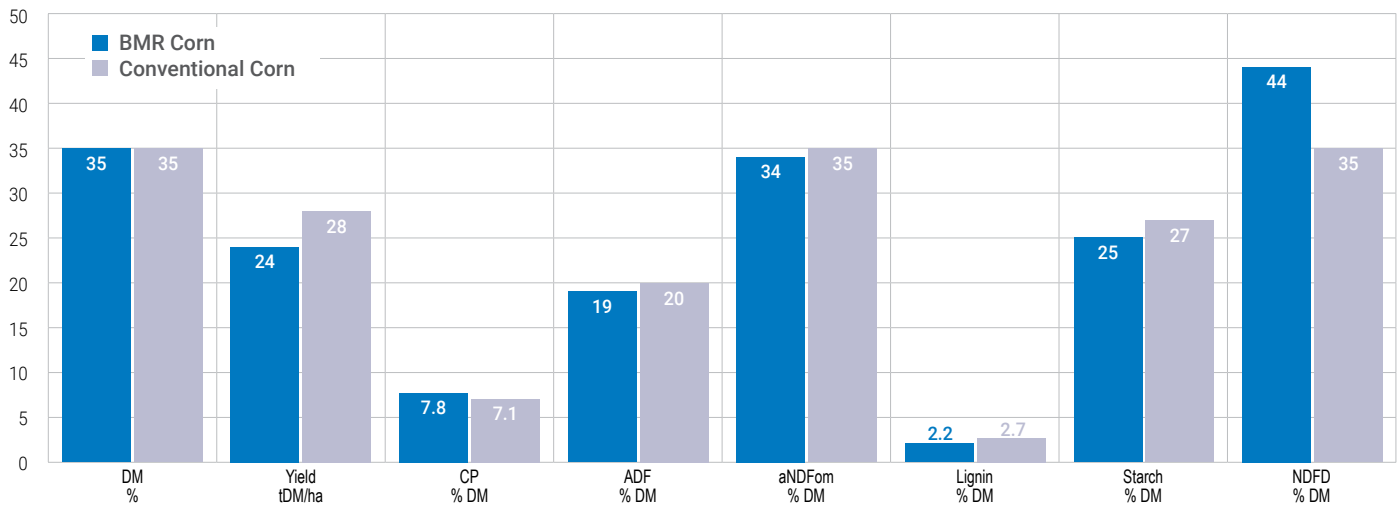
▼ BMR Corn



▼ Conventional Corn



**Image 1.** Comparison of plants and cobs between BMR corn and conventional corn at 35% dry matter.



**Figure 1.** Yield and nutrient composition of conventional corn and BMR corn harvested at 35% dry matter (DM: dry matter; t: tonnes; CP: crude protein); ADF (acid detergent fibre), aNDF (adjusted neutral detergent fibre); NDFD (neutral detergent fibre digestibility).

## Methods and Progress

The research was conducted at the Gatton Research Dairy in Queensland over 1.5 hectares of irrigated land during summer 2024/25. Both hybrids were treated equally. Fertilisation included a pre-planting application of urea at 287 kg/ha and a side-dress at the 5–6 leaf stage with 105.5 kg/ha to support robust growth. Seeds were sown on October 2, 2024, at a rate of 22.6 kg/ha.

The corn rows were spaced 75 cm apart. Irrigation and rainfall combined to provide 460 mm of water over the growing season (100 mm irrigation, 360 mm rainfall). Crop health was monitored weekly, with pest control applied twice for Fall armyworm and Helicoverpa, and one application of herbicide for annual and Johnson grasses, as well as broadleaf weeds.

The BMR corn reached tasselling on November 25th, about 10 days earlier than the conventional corn, which tasselled on December 6th. Both corn types were harvested at around 35% dry matter.

## Results

At harvest, both BMR and conventional corn plants exhibited agronomic similarities, characterised by tall stature, large cobs, soft grain kernels, and excellent stay-green characteristics—traits that contribute to strong standability and overall yield (Image 1, page 1). Figure 1 presents the different nutritional composition between the two hybrids.

- **Yield:** BMR corn yielded 23.81 tonnes dry matter (DM) per hectare compared to 27.97 tonnes DM per hectare for conventional corn, marking only a 4% reduction.
- **Starch and Lignin Content:** The starch content in BMR corn was approximately 4% lower than conventional corn. Lignin content was reduced by 18%. This substantial drop in lignin is key to improving forage digestibility.
- **Protein Content:** BMR corn had 11% higher protein content than conventional corn.
- **Digestibility:** The most outstanding benefit was in digestibility. Neutral Detergent Fibre Digestibility (NDFD), a critical measure of how well cows can digest fibre, was 26% higher in BMR corn.

These findings suggest that BMR corn provides a comparable yield and improved nutritional quality, making it a potential forage option. The improved digestibility could lead to better feed efficiency.

## Conclusion

BMR corn (bm1) represents a promising forage option for dairy farmers. Its lower lignin content converts to higher digestibility. While the yield is slightly reduced compared to conventional corn, the quality improvements could more than compensate, especially in systems where feed quality is prioritised. However, it is important to highlight that BMR corn matures faster, around 10 days earlier, due to its shorter comparative relative maturity, which could shorten the harvest window. Timely harvesting is crucial for conserving the best nutritional value and preventing quality losses. Coordinating equipment and contractors accordingly will be crucial to maximising the benefits of this forage variety. Overall, BMR corn provides an exciting opportunity to enhance dairy feeding systems with a forage that supports both cow health and farm productivity.

### Key Takeaways

- **Improved Digestibility and Nutritional Value:** BMR corn shows a 26% improvement in fibre digestibility and 11% higher protein content than conventional corn, enhancing feed quality and potentially boosting milk production.
- **Slight Yield Reduction but Better Quality:** Although BMR corn yields around 4% less than conventional hybrids, the trade-off is improved forage quality, making it a valuable option for dairy farms prioritising quality over quantity.
- **Shorter Harvest Window Requires Careful Management:** The faster maturity of BMR corn demands timely harvesting to preserve quality and maximise benefits, highlighting the need for effective scheduling and resource planning. ■ ■

BMR corn provides an exciting opportunity to enhance dairy feeding systems with a forage that supports both cow health and farm productivity.