

Higher yielding Improved powdery mildew resistance



MAIN ADVANTAGES

Jade-AU[®] is a large seeded bright green mungbean that is broadly adapted to the northern region. It is suitable for both 'spring planting' (Sept/early Oct) and 'conventional summer planting' (Dec/Jan).

It has a demonstrated consistent yield increase of 12% when compared to Crystal[®] across all regions of central and southern Queensland and northern New South Wales. It has grain quality equivalent to Crystal[®] and is highly acceptable in the market place.

Jade-AU[®] has the best available combined suite of resistance to powdery mildew (greater than Crystal[®]), tan spot and halo blight (ratings are equivalent to Crystal[®]).

Jade-AU[®] is of an equivalent plant type and has similar production agronomy to Crystal[®] and other current varieties.

SEED PROTECTION & ROYALTIES

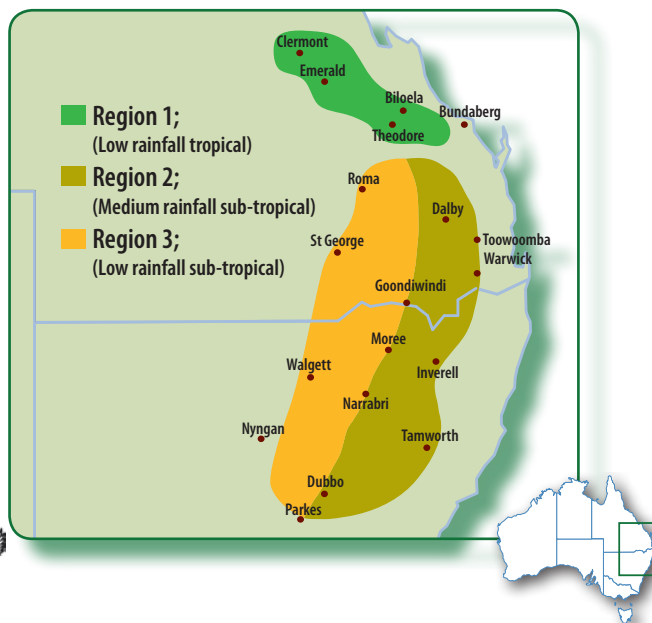
Jade-AU[®] is protected under Plant Breeder's Rights (PBR) legislation. Growers can only retain seed from their production of Jade-AU[®] for their own use.

A Seed Royalty, which includes breeder royalties, applies at the point of sale. This royalty helps to fund the National Mungbean Improvement Program and is re-invested in research to develop future mungbean varieties.

KEY FEATURES

- Jade-AU[®] is 12% higher yielding than Crystal[®] across five years of regional evaluation
- Moderately Susceptible (MS) to powdery mildew (better than Crystal[®] and Satin II[®])
- Moderately Susceptible (MS) to tan spot (field resistance is slightly better than Crystal[®])
- Tall, erect plant type that holds its pods high to increase harvestability
- Production agronomy and management equivalent to Crystal[®]
- Grain quality is equivalent to Crystal[®] (suitable for No.1, Processing and Manufacturing)

AREA OF ADAPTATION



YIELD & ADAPTATION

Jade-AU[®] is well adapted to both dryland and irrigated production across all regions where mungbean is currently grown. It has been tested by the National Mungbean Improvement Program at 38 sites between 2008 and 2012, this is the most rigorous evaluation program yet for any mungbean variety release.

Jade-AU[®] is on average 12% higher yielding than Crystal[®]. This response is relatively consistent across regions and seasons. Table 1, provides a summary of all 38 trials firstly, averaged by region across years and then averaged by year across regions.

Jade-AU[®] has demonstrated an average yield increase of 12% when compared to Crystal[®] across sites with low, medium and high yield potential (refer Figure 1), highlighting its reliable performance across all environments.

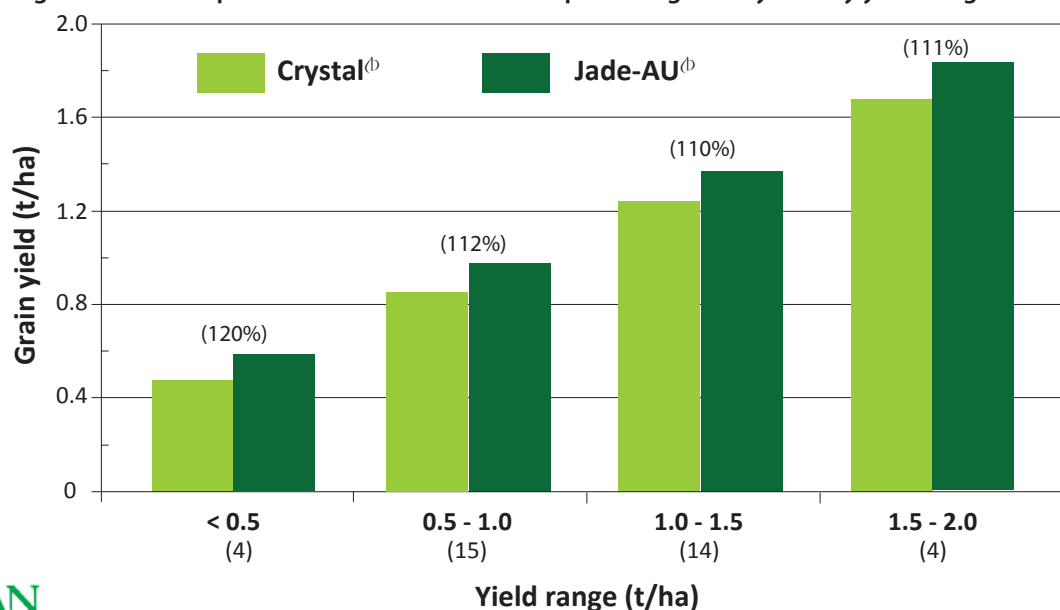
In a single evaluation in the Burdekin (2012), Jade-AU[®] yielded 1.6 t/ha and was 8% higher yielding than Crystal[®] and all other commercial varieties (none replicated strip trial).

Table 1: Long-term average yields expressed as a % of Crystal[®] by region and by years

Variety	Central Qld (14)	Southern Qld (15)	Northern NSW (9)	2008 (3)	2009 (8)	2010 (14)	2011 (9)	2012 (4)	Average (38)
Large seeded shiny green mungbean									
Jade-AU [®] (t/ha)	1.19	1.14	1.18	1.16	1.10	1.30	1.13	0.95	1.17
Jade-AU[®]	112	114	108	119	115	111	108	105	112
Berken	86	83	55	80	95	67	84	59	77
Crystal [®]	100	100	100	100	100	100	100	100	100
Small seeded shiny green mungbean									
Green Diamond [®]	78	71	46	84	95	50	73	59	72
Dull seeded green mungbean									
Satin II [®]	106	111	93	116	114	98	104	106	107

Source: Trial results from the National Mungbean Improvement Program (2008 - 2012)
Number in parentheses () shows the number of trials

Figure 1: Relative performance of Jade-AU[®] as a percentage of Crystal[®] by yield range



Source: Trial results from the National Mungbean Improvement Program (2008 - 2012)
Number in parentheses () shows the number of trials



DISEASE MANAGEMENT

Jade-AU[®] has the best available combined suite of resistance to powdery mildew, tan spot and halo blight.

Powdery mildew

Jade-AU[®] is Moderately Susceptible (MS) to powdery mildew.

Whilst it has greater resistance than Crystal[®] and mildew is slower to develop, the disease can still be economically damaging if it occurs prior to or at flowering.

Tan spot and halo blight

Jade-AU[®] is Moderately Susceptible (MS) to these diseases, tan spot field resistance is slightly better than Crystal[®]. Both of these diseases are caused by bacterium and as such foliar fungicide sprays are of no benefit. There are no effective in crop management options.

Growers should follow the guidelines as presented in the 'Mungbean Management Guide'.

Table 2: Disease resistance of Australian mungbean varieties

Variety	Powdery mildew			Tan spot			Halo blight		
	Rating	Score		Rating	Score		Rating	Score	
		Average	Range		Average	Range		Average	Range
Large seeded shiny green mungbean									
Jade-AU [Ⓛ]	MS	4.1	1.7 - 5.3	MS	3.1	2.0 - 4.0	MS	5.0	4.5 - 5.3
Berken	VS	6.2	5.0 - 7.5	S	5.9	4.3 - 8.0	S	6.3	5.0 - 8.0
Crystal [Ⓛ]	S	5.3	3.3 - 7.0	MS	4.0	2.7 - 5.3	MS	4.8	4.0 - 5.3
Small seeded shiny green mungbean									
Green Diamond [Ⓛ]	MS	4.5	3.0 - 7.5	S	5.1	3.7 - 6.7	S	6.9	6.0 - 7.7
Dull seeded green mungbean									
Satin II [Ⓛ]	S	5.1	3.7 - 7.0	MS	3.9	2.7 - 5.0	MS	5.0	3.7 - 6.3

Source: The National Mungbean Improvement Program

S = Susceptible, MS = Moderately Susceptible, MR = Moderately Resistance, R = Resistant

Score: 1 = no disease, 9 = dead

AGRONOMIC MANAGEMENT

Production agronomy is equivalent to current varieties. The growth habit of Jade-AU[®] is similar to Crystal[®], maturing in the same number of days and with equivalent plant height and lodging resistance.

Target an established plant population of;

- Dryland 25 plants/m²
- Irrigated 30 plants/m²

Table 3: Agronomic traits of Australian mungbean varieties

Variety	Seed weight (g/100 seeds)	Days to flowering	Days to maturity	Plant height (cm)	Lodging score	Shattering score
Large seeded shiny green mungbean						
Jade-AU [®]	6.6	44	85	63	2.9	1.3
Berken	5.8	45	84	61	5.0	1.0
Crystal [®]	6.1	45	84	66	2.1	1.3
Small seeded shiny green mungbean						
Green Diamond [®]	3.3	45	82	62	3.7	1.0
Dull seeded green mungbean						
Satin II [®]	5.9	44	83	65	2.5	1.3

Source: The National Mungbean Improvement Program

Score: 1 = no visible/adverse affect, 9 = severely affected

SEED QUALITY

The quality of grower retained seed will deteriorate over a period of time. These samples often look uneven and may have a large proportion of dull blue-green seeds mixed with shiny seeds.

Current industry best practice is for growers to replace their planting seed every 3 seasons to ensure that the seed is genetically pure, of the highest vigour and of minimal risk for the seed borne diseases tan spot and halo blight. These bacterial disease are seed borne and can significantly reduce yields.



AMA APPROVED SEED

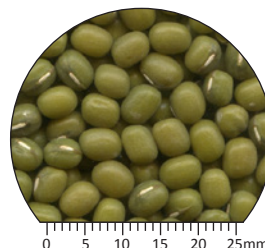
Only purchase seed that is clearly labelled as AMA Approved Seed.

This seed has been harvested from dedicated seed crops that have been inspected to ensure minimal risk of the seed borne diseases tan spot and halo blight.

It is available from your local AMA member or seed re-seller.

MARKETING

Jade-AU[®] has high grain quality characteristics, equivalent to Crystal[®] and is suitable for the No. 1, Processing and Manufacturing markets.



Jade-AU[®]



Crystal[®]

ENQUIRIES

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VARIETAL PURITY

Varietal purity is essential, as mixtures are unacceptable in the market place.

Mixed seed lines will often attract heavy discounts purely on their visual appearance. This particularly applies to contamination with varieties like Satin II[®], with its dull seed coat giving the appearance of weather damage in the sample.



*Australian grown mungbeans
have quality written all over them!*

BREEDING

The National Mungbean Improvement Program is led by Queensland Department of Agriculture, Fisheries and Forestry (DAFF) in partnership with the Grains Research and Development Corporation (GRDC) and the Australian Mungbean Association (AMA).

Jade-AU[®] (evaluated as M07213) was developed from a cross of VC2768A released by AVRDC, the World Vegetable Centre and the Australian breeding line 3511-9.

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Version September/2013