Soybean Factsheet

Version December 2018

The information in this document is current as at December 2018.
For updated information after this date, please refer to NSW DPI or CSIRO.

Richmond

VARIETY SUMMARY

- Richmond is a high yielding, clear hilum soybean variety to replace A6785 or Soya 791 for northern NSW and southern QLD growers who are seeking a human consumption variety in the early and mid season planting window
- Richmond has a compact plant type to minimise lodging, clean leaf drop and even ripening for harvest ease
- It is resistant to Powdery Mildew, highly tolerant to manganese toxicity and has the highest weathering tolerance of all current clear hilum varieties

BREEDING

Richmond was bred by Dr Andrew James, CSIRO and evaluated by Dr Natalie Moore, NSW DPI for the Australian Soybean Breeding Program.

Pedigree: Richmond (NF246-64) has the pedigree: Century 84-B14 3-35/Cowrie. Century 84 is from the USA. B14 is a large-seeded line bred by J Rose.

SOIL TYPE

Richmond is broadly adapted to most soil types including the acidic soils of coastal NSW.

MATURITY

Richmond is an intermediate maturing soybean suited to early sowing in production regions of the northern NSW tablelands, slopes and plains (mid Nov-mid Dec) and sowing in coastal NSW (from 1-31 Dec). In southern QLD, Richmond is suited to an early sowing window (mid- Nov – end of Dec).

Maturity is around 112 days in northern NSW, similar to A6785. Maturity is around 130 days in southern QLD similar to Bunya.

PLANT CHARACTERISTICS

Richmond has a compact plant type with clean leaf drop and even ripening for harvest ease. Richmond's lodging resistance is superior to that of Soya 791 and A6785.

GRAIN QUALITY

Richmond has a clear hilum, which allows growers wider market access including higher value human consumption markets as well as crushing markets. Richmond has a large seed size and high protein preferred by processors.

DISEASE RESISTANCE

Richmond is resistant to Powdery Mildew, has high tolerance to manganese toxicity, which is common in coastal soils, and has the highest weathering tolerance of all current clear hilum varieties (Table 1).

Figure 1. This Richmond test crop was grown by Fred Faulkner at Dobies Bight with assistance from Mark Carter and Dom Hogg, BGA Agriservices Casino NSW. Manta (left) yielded 3.45 t/ha and Richmond (right) yielded 3.62 t/ha in this unreplicated comparison. The crop was sown on 1 January 2011.

Photo N Moore, NSW DPI.

YIELD

Richmond has performed consistently well in trials in northern NSW compared with other current soybean varieties. Richmond addresses the 'yield gap' for clear hilum varieties compared to traditional dark hilum varieties such as A6785 and Manta (Figure 1) whilst maintaining high protein and large seed size.

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Table 1. Plant characteristics and disease resistance of Richmond soybean in comparison to other varieties

Variety	Hilum Colour	Grain Use	Sowing Time	Manganese tolerance	Phytophthora root rot				Powdery Mildew	Weathering tolerance 2009-18 % unweathered grain
					1	4	15	25		
Richmond	Clear	Human	Mid	High	Y	Y	Y	Y	Resistant	73
A6785	Brown	Crushing	Mid-late	Low	Y	Y	Y	Y	Resistant	76
Soya 791	Tan	Human	Early	Low	Y	Y	N	Y	Resistant	53
Moonbi (2011)	Clear	Human	Early	Mid	Y	Y	Y	Y	Resistant	68
Bunya (2006)	Clear	Human	Early-mid (INLAND)	Mid	Y	Y	Y	Y	Susceptible	70

Table 2. Long term grain yield comparisons of Richmond from replicated trials in Northern NSW (NSW DPI)

Variety	Sowing Time	Grain Use	Yield Grafton 09-18 t/ha @ 12% moisture	Protein Grafton 09-18 % dry matter basis	Seed size (Grafton 09-18)	
					Grams per 100 seeds	No. seeds per kg @12% moisture
Richmond	Mid	Human	4.3	41.9	22	4545
A6785	Mid-late	Crushing	3.7	39.4	15	6666
Soya 791	Early	Human	4.1	41.4	18	5555
Moonbi (2011)	Early	Human	3.8	42.5	21	4760
Bunya (2006)	Early-mid (INLAND)	Human	3.8	40.4	24	4166

AGRONOMIC GUIDELINES

Sowing

Seed should be sown into moist soil to a depth of no more than 5 cm. Dryland soybean should be planted into a full profile of soil moisture (100–120 cm wet soil) in the Northern Slopes and Plains of NSW and 60–80 cm of wet soil in the NSW Northern Tablelands. Irrigated soybean fields should be irrigated before sowing and allow a budget of 6–8 ML/ha. Planting at the optimum time for the variety maximises yield potential and grain quality by taking full advantage of daylight/heat units and avoids damage from early frosts. Achieving the correct plant population for local conditions is critical to achieving yield potential. Optimum seeding rates vary widely across regions and should be calculated based on seed size, the target plant population appropriate for the region, row spacing and sowing time (Tables 3 and 4).

Table 3. Recommended regions and sowing times for Richmond

Recommended Regions	Sowing Window
Southern QLD	Mid Nov-late Dec
NSW: Tablelands, Northern Slopes & Liverpool Plains	Mid Nov-mid Dec
NSW: North Coast	1 – 31 Dec

Table 4. Target plant populations

Location	Target plant population established plants/m2
NSW Northern Inland	
Irrigation/mild dryland areas	25–30
Dryland/Slopes and Plains	15–20
Tablelands	35–40
NSW North Coast	
Narrow rows (< 75 cm)	30–40
Wide rows (> 75cm)	28–32

Use the following formula to calculate sowing rates. An establishment rate of 85% suits most situations.

1000 Seed Weight (grams)	x	Target Plant Population	÷	100	÷	Establishment % x Germination % .....

= Your Seeding Rate.....kg/ha

Nutrition

Always inoculate seed correctly using the soybean-specific strain of Group H inoculant (strain CB 1809). In most situations soybean requires little to no 'starter' nitrogen. Too much nitrogen at planting (>25kg N/ha) can interfere with nodulation and may result in low residual N benefits from the crop.

Critical nutrients for soybean production include phosphorous (P), potassium (K), sulfur (S), and trace elements including zinc (Zn) on heavy grey clay soils and molybdenum (Mo) on acidic soils of the tablelands and coast. Nutrient budgets should be calculated on the basis of a recent soil test.

Weed and insect management

Controlling weeds in the early stages of crop growth before canopy closure will remove competition and improve yield. A wide range of pre and post-emergent herbicides are available.

Soybean crops generally host a wide range of beneficial insects making them ideal for Integrated Pest Management (IPM) practices. Inspect crops for insect pests and beneficials at least once a week before flowering and then twice a week from flowering to maturity.

Harvest and grain handling

Harvest soybean crops as soon as mature to reduce the risk of weather damage or harvest losses from over-dry grain. Soybean has a delicate seed coat and should be treated with care to avoid dropping seed.

Figure 2. This photo shows Richmond in a replicated field evaluation conducted by Brad Schwark, 'Narallen', at Oakwood NSW in the 2012-2013 season. Richmond (pictured) yielded 3.07 t/ha compared with Moonbi (2.92 t/ha) and Soya 791 (2.64 t/ha). The trial was sown on 19 December 2012. Note the clean leaf drop and lack of lodging of Richmond.

Photo N Moore, NSW DPI.

PLANT BREEDER RIGHTS & ROYALTIES

Richmond is protected by Plant Breeder Rights, any unauthorised commercial propagation or any sale, conditioning, export, import or stocking of propagating material of this variety is an infringement under the Plant Breeder's Rights Act, 1994.

Growers are allowed to retain seed from production of this variety for their own use as seed only.

An End Point Royalty of $6 per tonne (+ GST), which includes breeder royalties, applies to this variety.

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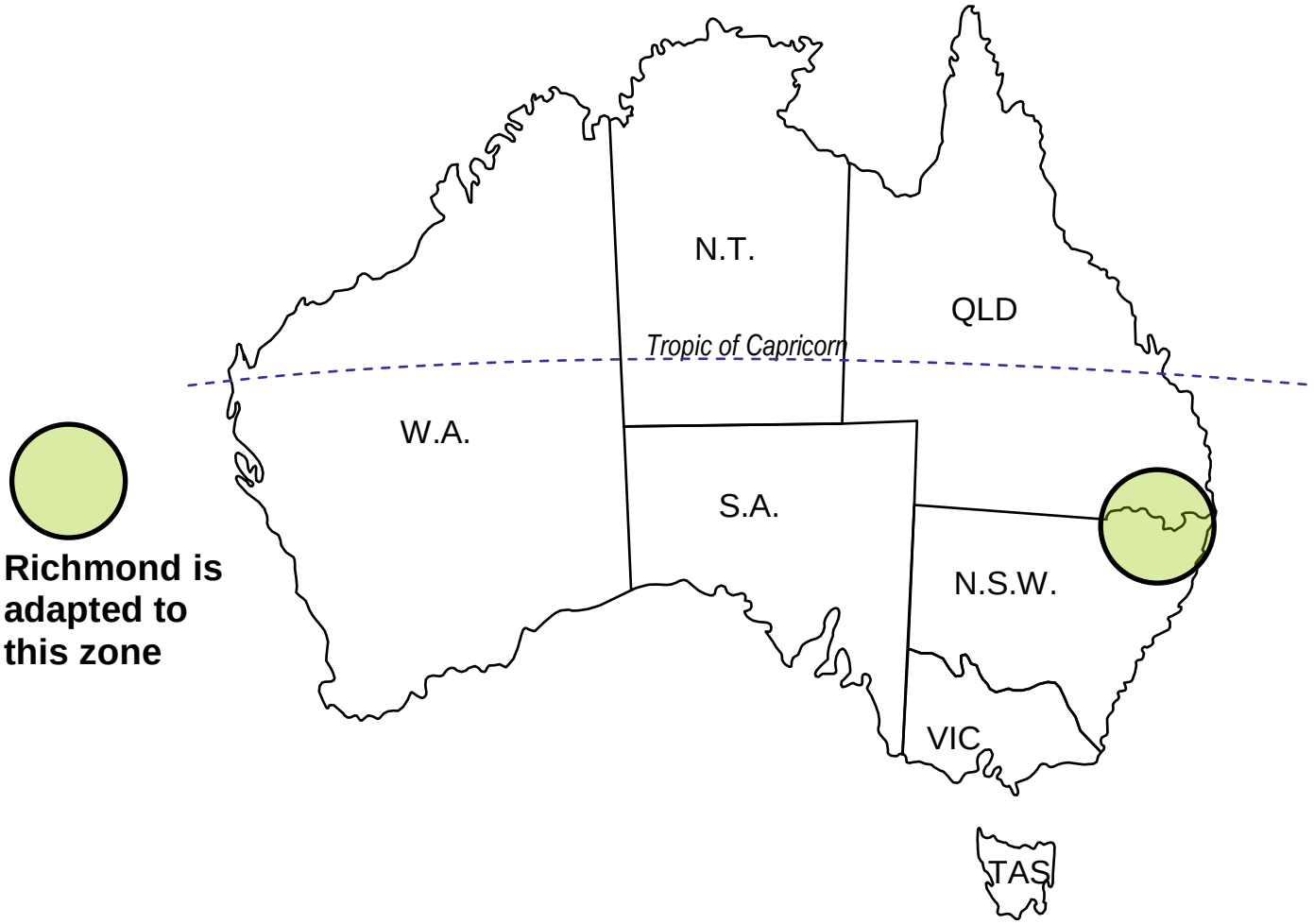
Where should I grow Richmond?



For optimum crop performance, soybean varieties should be grown within their zone of adaptation.

For Richmond in Queensland this includes the production regions of southern Queensland such as the Darling Downs, Lockyer Valley, and areas around Killarney and Beaudesert. It is not well adapted north of these areas.

For Richmond in New South Wales Richmond is best suited to the production regions of the North Coast, northern Tablelands, slopes and plains, and the Liverpool Plains. It is not well adapted south of these areas.

ACKNOWLEDGEMENTS

Richmond was bred by Dr Andrew James, CSIRO and evaluated and selected by Dr Natalie Moore, NSW DPI for the Australian Soybean Breeding Program with support from growers through the GRDC.

For more information call Seednet on 1300 799 246
or Jon Thelander on 0429 314 909 or visit www.seednet.com.au