


High yielding IMI tolerant lentil more reliable on lighter textured mallee soils

KEY FEATURES

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- ✓ **High yielding broadly adapted IMI tolerant red lentil** with improved tolerance to boron and salt
 - ✓ **Good adaptation and high relative yields** on lighter textured soils in the Mallee region
 - ✓ **Tolerant to applied IMI** (Intercept[®], as per label) and residual levels of IMI and SU from prior crops, equivalent to existing XT and GIA varieties
 - ✓ **Upright bush type plant structure** aids in harvestability
 - ✓ **Provisionally rated resistant** to the Nipper and moderately resistant/moderately susceptible to the Hurricane ascochyta blight pathotypes
 - ✓ **Provisionally rated moderately susceptible** to botrytis grey mould (BGM)
 - ✓ **Small, rounded red lentil seed** with a grey seed coat



LIGHTNING[Ⓟ] IMI Lentil



ADAPTATION & GRAIN YIELD

GIA Lightning[Ⓟ] is a broadly adapted variety and has been high yielding across all lentil growing areas of southern Australia in GRDC NVT trials from 2020-2023 where botrytis grey mould (BGM) has been effectively controlled. It had average yield increases across SA and Victoria of 10% over PBA Hurricane XT[Ⓟ] in 2020, 2021 and 2023. However, it averaged 8% lower than PBA Hurricane XT[Ⓟ] in 2022 where BGM was not controlled effectively in these trials and reduced yields of all varieties. GIA identified GIA Lightning[Ⓟ] for the Mallee regions of SA and Victoria in a project funded by The South Australian Grain Industry Trust (SAGIT). GIA Lightning[Ⓟ] was the most reliable lentil variety on lighter textured sandy soils

due to its combination of high and stable yield, and good harvestability, yielding 10% higher than GIA Thunder[Ⓟ]. GIA Lightning[Ⓟ] was found to have a unique extended growth pattern during flowering and early podding that can capitalize on late season rainfall events. Conversely, GIA Thunder[Ⓟ] averaged 8% higher than GIA Lightning[Ⓟ] on all other soil types in this set of 22 GIA breeding trials. GIA Lightning[Ⓟ] generally yields similarly or slightly lower than GIA Thunder[Ⓟ] in SA and Victoria, except in situations where BGM is not controlled effectively, such as NVT trials in 2022, where it averaged approximately 30% lower than GIA Thunder[Ⓟ]. GIA Lightning[Ⓟ] has also generally produced yields similar but slightly lower yield than GIA Thunder[Ⓟ] in NVT trials in WA.

All Australia NVT predicted MET yield of lentil varieties (% PBA Hurricane[Ⓟ] XT) 2019-2023

Yield Group	0.3 - 1.5 t/ha	1.5 - 2.5 t/ha	2.5 - 5.0 t/ha
IMI tolerant varieties			
GIA Lightning[Ⓟ]	116	107	102
GIA Thunder [Ⓟ]	115	117	117
GIA Leader [Ⓟ]	97	100	101
ALB Terrier [Ⓟ]	109	111	112
PBA HighlandXT [Ⓟ]	109	102	100
PBA Kelpie XT [Ⓟ]	101	103	101
PBA Hurricane XT [Ⓟ]	100	100	100
PBA Hallmark XT [Ⓟ]	101	97	99
Dual herbicide tolerant varieties			
GIA Sire [Ⓟ]	95	82	79
GIA Metro [Ⓟ]	69	76	78
Conventional variety			
PBA Jumbo2 [Ⓟ]	106	110	109
PBA Hurricane XT Yield (t/ha)	1.05	1.95	3.38
No. of trials	14	30	19

Data accessed 29/02/2024 from NVT Long term Yield Report, nvt.grdc.com.au

2019-2023 SA and Vic NVT predicted MET yield performance of lentil varieties (as % Site Mean).

Variety	2019		2020		2021		2022		2023	
	SA	Vic	SA	Vic	SA	Vic	SA	Vic	SA	Vic
IMI Tolerant Varieties										
GIA Lightning[Ⓟ]			108	111	107	110	92	92	109	106
GIA Thunder [Ⓟ]			115	109	110	106	124	126	110	109
GIA Leader [Ⓟ]	95	105	102	101	96	107	102	88	95	99
ALB Terrier [Ⓟ]					105	102	120	123	102	107
PBA HighlandXT [Ⓟ]	104	99	98	97	102	99	98	101	104	99
PBA Kelpie XT [Ⓟ]	105	99	97	97	98	99	104	106	105	100
PBA Hurricane XT [Ⓟ]	97	100	100	101	97	100	100	96	98	99
PBA Hallmark XT [Ⓟ]	96	99	94	94	97	96	104	103	93	95
Dual Herbicide Tolerant Varieties										
GIA Sire [Ⓟ]					89	97	62	59	92	89
GIA Metro [Ⓟ]					74		72	75	80	81
Conventional Variety										
PBA Jumbo2 [Ⓟ]	108	104	105	100	103	99	118	119	105	101
Mean yield (t/ha)*	1.72 (6)	2.02 (4)	2.53 (6)	2.0 (5)	3.63 (3)	2.79 (1)	3.18 (7)	2.89 (4)	2.24 (7)	1.68 (4)

(Data accessed from the GRDC NVT website on 05/10/2024). *Number of trials shown in brackets

AGRONOMY

General paddock selection and agronomic production requirements for growing GIA Lightning[®] are the same as for other IMI tolerant lentil varieties. Refer to GRDC Lentil Grownotes and Lentil Ute Guide (www.grdc.com.au).

GIA Lightning[®] has the same level of tolerance to applied IMI (Intercept[®], as per herbicide label) and residual levels of IMI and sulfonylurea (SU) herbicides as current XT lentil varieties (e.g. PBA Hurricane XT[®]), GIA Leader[®] and GIA Thunder[®].

It is imperative growers adhere to product label rates, plant-back periods and all label directions for herbicide use.

GIA Lightning[®] has a similar flowering time to GIA Leader[®] and is generally 2 to 5 days later flowering than PBA Hurricane XT[®] and GIA Thunder[®], although these relativities can vary with sowing date and climatic conditions across environments. The maturity of GIA

Lightning[®] is similar but generally slightly later than PBA Hurricane XT[®] and GIA Thunder[®] but earlier than GIA Leader[®]. GIA Lightning[®] matures more evenly than varieties such as PBA Hallmark XT[®] and PBA Highland-XT[®] in which, with late season rainfall events, stems can remain green when the pods are ripening.

The levels of pod drop and shattering in GIA Lightning[®] are similar to that observed in PBA Hurricane XT[®]. Derived from a PBA Ace[®] and PBA Hurricane XT[®] background, GIA Lightning[®] has an upright bush type plant structure at maturity that aids harvestability, particularly on uneven soil surfaces and/or where plant numbers are below optimal levels.

As with all lentil varieties the correct application, timing and product selection for effective desiccation is required in GIA Lightning[®], refer to GRDC Lentil Grownotes and the Lentil Ute Guide (www.grdc.com.au).

Agronomic and disease characteristics of GIA Lightning[®] compared with other lentil varieties

Variety	Vigour	Vegetative frost*	Flower time	Maturity	Lodging resistance	Pod drop	Shattering	Ascochyta blight#		BGM#	Root lesion nematode#	Boron	Salinity
								Nipper virulent#	Hurricane virulent#				
IMI tolerant varieties													
GIA Lightning[®]	Mod	Moderate	Mid-late	Mid	MR	MR	MRR(p)	R(p)	MRMS(p)	MS(p)	MRMS(p)	MI	MI
GIA Thunder [®]	Mod	Mod-good	Mid	Mid	MRMS	MR	MRR(p)	R(p)	MRMS(p)	MRMS(p)	MR(p)	MI	MI
GIA Leader [®]	Mod	Mod-good	Mid-late	Mid-late	MR	MR	MR(p)	MR(p)	MR(p)	MRMS(p)	MRMS(p)	I	I
ALB Terrier [®]	Mod [^]	Moderate [^]	Mid [^]	Mid [^]	MRMS [^]	MR [^]	MR [^]	R	MR(p)	MRMS(p)	MR	MI [^]	MI [^]
PBA Highland- XT [®]	Mod-good [^]	Poor-mod [^]	Early [^]	Early-mid [^]	MR [^]	MR [^]	MR [^]	MR	MR(p)	MS	MR	I [^]	MI [^]
PBA KelpieXT [®]	Mod-good [^]	Mod-good [^]	Early-mid [^]	Early-mid [^]	MRMS [^]	MR [^]	R [^]	MRMS	MRMS	MS	MRMS	I [^]	MI [^]
PBA Hurricane XT [®]	Mod [^]	Poor [^]	Mid [^]	Mid [^]	MR [^]	MR [^]	R [^]	RMR	MRMS(p)	MS	MRMS	I [^]	I [^]
PBA Hallmark XT [®]	Mod-good [^]	Poor-mod [^]	Mid [^]	Mid [^]	MR [^]	MR [^]	R [^]	RMR	MRMS	MRMS	MR	I [^]	MI [^]
Conventional Variety													
PBA Jumbo2 [®]	Mod-good [^]	Mod-good [^]	Mid [^]	Mid [^]	MRMS [^]	MR [^]	R [^]	R	RMR	MR(p)	MR	MI [^]	I [^]

Legend: (p) = provisional, Mod = moderate. [^]Data source GRDC Crop Sowing Guides and ALB Terrier[®] brochure www.grdc.com.au (October 2024). #Data source NVT National Pathology Ratings www.grdc-nvt.com.au (October 2024), data derived from controlled environment and/or field nurseries and may not be indicative of relative variety response in paddocks.

*Field-based observation ratings relative to PBA Hurricane XT[®].

DISEASE AND ABIOTIC TOLERANCE

GIA Lightning[®] is provisionally rated as resistant (R) and moderately resistant/moderately susceptible (MRMS) for the Nipper and Hurricane virulence strains of ascochyta blight, respectively, by the GRDC NVT National Pathology Rating system. GIA Lightning[®] is provisionally rated as moderately susceptible (MS) to botrytis grey mould and is likely to require the same disease management strategy as used for PBA Highland XT[®] and PBA Hurricane XT[®]. GIA Lightning[®] is not well suited to areas and situations where this disease regularly reduces lentil yields and profitability. **Disease management for GIA Lightning[®] should follow the GRDC Lentil Grownotes and the Lentil Ute Guide (www.grdc.com.au) recommendations for the relevant disease ratings.**

GIA Lightning[®] has improved levels of vegetative frost tolerance over PBA Hurricane XT[®], PBA Hallmark XT[®] and PBA Highland-XT[®]. It also has improved boron + salt tolerance, rated as moderately intolerant (MI) to both boron and salinity (NaCl). It has not been assessed for virus resistance, and heat tolerance and should be treated as susceptible, or intolerant, for these characteristics.

GRAIN QUALITY & MARKETING

GIA Lightning[Ⓟ] produces a small, rounded red lentil grain with a grey seed coat. Grain size of GIA Lightning[Ⓟ], as measured by average 100 grain weight has been very similar to PBA Hurricane XT[Ⓟ] in GRDC NVT trials in 2021, 2022 and 2023. Appropriate insect, pest and disease management practices in GIA Lightning[Ⓟ] will assist growers in minimising poor colour and achieving market acceptable grain quality, refer to GRDC Lentil Grownotes and the Lentil Ute Guide (www.grdc.com.au). Grain of GIA Lightning[Ⓟ] should be segregated for marketing purposes unless otherwise stated, however, its small- sized grain, shape and grey seed coat colour are consistent with traditional small red marketed varieties such as PBA Hurricane XT[Ⓟ] and Nipper[Ⓟ] and very similar to that of the small red lentil GIA Thunder[Ⓟ]. Occasionally, some environmental conditions can result in a trace of grain with seed coat speckling, as seen in previously marketed varieties like PBA Herald XT and Aldinga.

Grain characteristics of GIA Lightning[Ⓟ] compared with other lentil varieties

Variety	Market category	Seed shape	Seed coat colour	Cotyledon colour	Seed size (g/100 seeds)#
IMI tolerant varieties					
GIA Lightning[Ⓟ]	SRP	Round	Grey	Red	3.65
GIA Thunder [Ⓟ]	SRP	Round	Grey	Red	3.74
PBA Highland XT [Ⓟ]	SRP	Round	Grey	Red	3.80
PBA Hurricane XT [Ⓟ]	SRP	Round	Grey	Red	3.52
ALB Terrier [Ⓟ]		Round	Grey	Red	3.92
PBA Hallmark XT [Ⓟ]	MRS	Lens	Grey	Red	3.99
GIA Leader [Ⓟ]	MRS	Lens	Grey	Red	4.47
PBA Kelpie XT [Ⓟ]	LRS	Lens	Grey	Red	4.70
Conventional variety					
PBA Jumbo2 [Ⓟ]	LRS	Lens	Grey	Red	4.87

Legend SRP=small red premium round, MRS=medium red split, LRS=large red split. #Data source NVT Trials 2021-23, 36 trial sites across western & southern Australia (balanced data set for all varieties), www.grdc-nvt.com.au

SEED PROTECTION & ROYALTIES

GIA Lightning[Ⓟ] is protected under Plant Breeders Rights (PBR) legislation. A PBR bag licence applies to the seed purchased and a seed technology fee applies to the seed price. Licensed growers can only retain seed for their own sowing or for sale as a commodity. GIA Lightning[Ⓟ] is open marketed with an End Point Royalty (EPR) of \$5.40/t (excluding GST), applying upon delivery of all grain of this variety.

GIA receives no funding from the Grains Research and Development Corporation (GRDC) or state and federal governments for breeding and therefore EPR's are critical for GIA to continue delivering innovative varieties that increase on-farm profitability for growers.

BREEDING

GIA Lightning[Ⓟ] was developed by Grains Innovation Australia (GIA) and derived from the IMI tolerant variety PBA Hurricane XT[Ⓟ] and a PBA Ace[Ⓟ] background using conventional breeding techniques. GIA Lightning[Ⓟ] is commercialised by PB Seeds.

SEED ENQUIRIES

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The information in this document is current as at October 2024. For updated information after this date, please refer to the GRDC NVT and GIA (www.grainsinnovation.com) websites.