THUNDER PBR IMI Lentil

Highest yielding broadly adapted IMI tolerant lentil

KEY FEATURES

- **First IMI lentil with improved boron + salt tolerance,** rated moderately intolerant for both boron and salt
- **Higher average grain yield than all varieties,** including an average increase of 14 to 18% above PBA Hurricane XT$^{\Phi}$, PBA Hallmark XT$^{\Phi}$, PBA Highland XT$^{\Phi}$ and PBA Kelpie XT$^{\Phi}$ across all SA & Vic NVT trials from 2020 to 2023
- **Moderate to good vegetative frost tolerance,** superior to all IMI varieties (except GIA Metro$^{\Phi}$-good & PBA Kelpie XT$^{\Phi}$ -similar rating)
- **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
- **Mid flowering and maturity timings**, similar to PBA Hurricane XT$^{\Phi}$
- **Provisionally rated resistant** to the Nipper and moderately resistant/ moderately susceptible to the Hurricane ascochyta blight pathotypes
- **Small, rounded red lentil seed** with a grey seed coat

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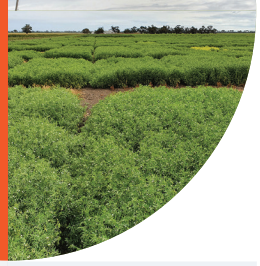
pbseeds
where every seed counts



THUNDER Φ PBR
IMI Lentil

GRAINS INNOVATION AUSTRALIA

ADAPTATION & GRAIN YIELD

GIA Thunder^{Φ} is the highest yielding imidazolinone (IMI) tolerant lentil across all growing areas of southern Australia in GRDC NVT trials from 2020 to 2023. It averaged between 14 and 18% higher yields in South Australia and Victoria, than all current IMI tolerant PBA varieties.

GIA Thunder^{Φ} has been generally higher yielding than GIA Lightning^{Φ} and ALB Terrier^{Φ} in southern Australia. GIA Thunder^{Φ} generally yields similarly or slightly above GIA Lightning^{Φ} in SA and Victoria, except in situations where botrytis grey mould is not controlled effectively, such as NVT trials in 2022, where it averaged approximately 30% higher than GIA Lightning^{Φ} in SA and Victoria.

However, GIA Lightning^{Φ} was the most reliable lentil variety on lighter textured sandy soils, with an average yield increase of 10% over GIA Thunder^{Φ} on these soils (7 SA Grains Industry Trust & GIA trials) in 2020 and 2021. Conversely, GIA Thunder^{Φ} averaged 8% higher than GIA Lightning^{Φ} on all other soil types in this set of 22 GIA breeding trials.

GIA Thunder^{Φ} has yield increases over ALB Terrier^{Φ} of 4-8% in SA and 2-5% in Victoria (data averaged across all NVT sites for the years of 2021, 2022 & 2023).

GIA Thunder^{Φ} was the first IMI tolerant variety to be consistently similar or higher yielding than the conventional high yielding variety, PBA Jumbo2^{Φ} in NVT trials.

All Australia NVT predicted MET yield of lentil varieties (% PBA Hurricane^{Φ} 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 Thunder^{Φ}	**115**	**117**	**117**
GIA Lightning^{Φ}	116	107	102
GIA Leader^{Φ}	97	100	101
ALB Terrier^{Φ}	109	111	112
PBA HighlandXT^{Φ}	109	102	100
PBA Kelpie XT^{Φ}	101	103	101
PBA Hurricane XT^{Φ}	100	100	100
PBA Hallmark XT^{Φ}	101	97	99
Dual herbicide tolerant varieties			
GIA Sire^{Φ}	95	82	79
GIA Metro^{Φ}	69	76	78
Conventional variety			
PBA Jumbo2^{Φ}	106	110	109
PBA Hurricane XT^{Φ} 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 Thunder^{Φ}			**115**	**109**	**110**	**106**	**124**	**126**	**110**	**109**
GIA Lightning^{Φ}			108	111	107	110	92	92	109	106
GIA Leader^{Φ}	95	105	102	101	96	107	102	88	95	99
ALB Terrier^{Φ}					105	102	120	123	102	107
PBA HighlandXT^{Φ}	104	99	98	97	102	99	98	101	104	99
PBA Kelpie XT^{Φ}	105	99	97	97	98	99	104	106	105	100
PBA Hurricane XT^{Φ}	97	100	100	101	97	100	100	96	98	99
PBA Hallmark XT^{Φ}	96	99	94	94	97	96	104	103	93	95
Dual herbicide tolerant varieties										
GIA Sire^{Φ}					89	97	62	59	92	89
GIA Metro^{Φ}					74		72	75	80	81
Conventional variety										
PBA Jumbo2^{Φ}	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 Thunder$^{\Phi}$ are the same as for other IMI tolerant lentil varieties. Refer to GRDC Lentil Grownotes and Lentil Ute Guide (www.grdc.com.au).

GIA Thunder$^{\Phi}$ 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$^{\Phi}$), GIA Leader$^{\Phi}$ and GIA Lightning$^{\Phi}$.

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

GIA Thunder$^{\Phi}$ has a similar flowering time to PBA Hurricane XT$^{\Phi}$, later than PBA Hallmark XT$^{\Phi}$ and PBA Highland XT$^{\Phi}$ but earlier than GIA Lightning$^{\Phi}$ and GIA Leader$^{\Phi}$, although relativities can vary with sowing date and climatic conditions across environments.

The maturity timing of GIA Thunder$^{\Phi}$ is also similar to PBA Hurricane XT$^{\Phi}$ and earlier than GIA Lightning$^{\Phi}$ and GIA Leader$^{\Phi}$. Like GIA Lightning$^{\Phi}$, GIA Thunder$^{\Phi}$ matures more evenly than varieties such as PBA Hallmark XT$^{\Phi}$ and PBA Highland-XT$^{\Phi}$ in which, with late season rainfall events, stems can remain green when pods are ripening.

The lodging resistance of GIA Thunder$^{\Phi}$ plants at maturity is less than in more erect varieties, such as GIA Lightning$^{\Phi}$, PBA Hallmark XT$^{\Phi}$ and PBA Highland-XT$^{\Phi}$, but generally similar to that observed in the highly harvestable variety PBA Jumbo 2$^{\Phi}$. The levels of pod drop and shattering in GIA Thunder$^{\Phi}$ have generally been found to be similar to or lower than those observed in PBA Hurricane XT$^{\Phi}$.

As with all lentil varieties the correct application, timing and product selection for effective desiccation is required in GIA Thunder$^{\Phi}$, refer to GRDC Lentil Grownotes and the Lentil Ute Guide (www.grdc.com.au).

Agronomic and disease characteristics of GIA Thunder$^{\Phi}$ 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#		P.neglectus#		
IMI tolerant varieties													
GIA Thunder$^{\Phi}$	**Mod**	**Mod-good**	**Mid**	**Mid**	**MRMS**	**MR**	**MRR(p)**	**R(p)**	**MRMS(p)**	**MRMS(p)**	**MR(p)**	**MI**	**MI**
GIA Lightning$^{\Phi}$	Mod	Moderate	Mid-late	Mid	MR	MR	MRR(p)	R(p)	MRMS(p)	MS(p)	MRMS(p)	MI	MI
GIA Leader$^{\Phi}$	Mod	Mod-good	Mid-late	Mid-late	MR	MR	MR(p)	MR(p)	MR(p)	MRMS(p)	MRMS(p)	I	I
ALB Terrier$^{\Phi}$	Mod^	Moderate^	Mid^	Mid^	MRMS^	MR^	MR^	R	MR(p)	MRMS(p)	MR	MI^	MI^
PBA Highland- XT$^{\Phi}$	Mod-good^	Poor-Moderate^	Early^	Early-mid^	MR^	MR^	MR^	MR	MR(p)	MS	MR	I^	MI^
PBA KelpieXT$^{\Phi}$	Mod-good^	Mod-good^	Early - mid^	Early-mid^	MRMS^	MR^	R^	MRMS	MRMS	MS	MRMS	I^	MI^
PBA Hurricane XT$^{\Phi}$	Mod^	Poor^	Mid^	Mid^	MR^	MR^	R^	RMR	MRMS(p)	MS	MRMS	I^	I^
PBA Hallmark XT$^{\Phi}$	Mod-good^	Poor-Moderate^	Mid^	Mid ^	MR^	MR^	R^	RMR	MRMS	MRMS	MR	I^	MI^
Conventional Variety													
PBA Jumbo2$^{\Phi}$	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$^{\Phi}$ 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 Thunder$^{\Phi}$ 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 Thunder$^{\Phi}$ is provisionally rated as moderately resistant/moderately susceptible (MRMS) to botrytis grey mould (BGM) compared with moderately susceptible (MS) for PBA Highland-XT$^{\Phi}$, PBA Hurricane XT$^{\Phi}$ and GIA Lightning$^{\Phi}$. **Disease management for GIA Thunder$^{\Phi}$ should follow the GRDC Lentil Grownotes and the Lentil Ute Guide (www.grdc.com.au) recommendations for the relevant disease ratings**

GIA Thunder$^{\Phi}$ has improved levels of tolerance (Moderate-good) to vegetative frost over all IMI varieties except for PBA KelpieXT$^{\Phi}$, where the response is similar, and GIA Metro$^{\Phi}$ (rated Good).

GIA Thunder$^{\Phi}$ is the first IMI lentil with improved boron + salt tolerance, rated moderately intolerant for both boron and salt. This dual improved rating is the same as the conventional variety PBA Bolt$^{\Phi}$ and an improved combined rating over most other lentil varieties. It has not been assessed for virus resistance and heat tolerance and should be treated as susceptible, or intolerant, for these characteristics.

THUNDER® PBR IMI Lentil

GRAIN QUALITY & MARKETING

GIA Thunder® produces a small, rounded red lentil grain with a grey seed coat. Grain size, as measured by average 100 grain weight, is generally slightly heavier than PBA Hurricance XT® but slightly less than PBA Highland-XT®.

Appropriate insect, pest and disease management practices in GIA Thunder® 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 Thunder® 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 Lightning®. 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 Thunder® compared with other lentil varieties

Variety	Market category	Seed shape	Seed coat colour	Cotyledon colour	Seed size (g 100 seeds)#
IMI tolerant varieties					
GIA Thunder®	**SRP**	**Round**	**Grey**	**Red**	**3.74**
GIA Lightning®	SRP	Round	Grey	Red	3.65
PBA HighlandXT®	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 premiun 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 Thunder® 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 Thunder® 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 Thunder® was developed by Grains Innovation Australia (GIA) and derived from the IMI tolerant variety PBA Hurricane XT® and popular conventional variety PBA Bolt® using conventional breeding techniques. GIA Thunder® 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.grainsinnnovation.com) websites.

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