Genesis™ 510

Desi chickpea

VMP 2009 #12

KEY FEATURES

- **Ascochyta resistant desi chickpea release in Western Australia only**
- **Highest yielding desi under strong ascochyta disease pressure**
- **Resistant to ascochyta blight, showing no or minimal yield loss under high ascochyta disease pressure**
- **Requires one fungicide application for control of ascochyta blight**
- **Broadly adapted, mid to early flowering variety with medium plant height and good harvestability**
- **Provides a low ascochyta blight risk, low input and high yielding desi chickpea option**
- **A desi type with small sized grain**
- **An ascochyta resistant desi alternative to Genesis™ 090 and other small kabuli chickpeas**
- **Like most chickpeas, it cannot be crop topped to prevent seed set of escape weeds like herbicide resistant ryegrass, and its height makes it unsuitable for weed wiping those weed escapes.**
- **It suits many farming systems including inter-row sowing into standing stubbles and wider (>30cm) row spacings**

Where Genesis™ 510 fits into the farming system:

Genesis™ 510 provides a low ascochyta blight risk, lower input and high yielding desi chickpea option to growers in Western Australia. It is expected to compliment Genesis™ 836 as desi alternatives to kabuli varieties, dependent upon marketing preferences.

Variety Characteristics:

Breeding: Genesis ™ 510 (tested as FLIP94-510C) is an introduction from the International Center for Agricultural Research in the Dry Areas (ICARDA), Syria. It was selected and released by the Victorian Department of Primary Industries as part of the National Chickpea Breeding Program.

Agronomic Characteristics: Genesis™ 510 is a high yielding and widely adapted desi chickpea with resistance to ascochyta blight. It's flowering time is earlier than Howzat. Maturity time is approximately 5 days earlier than Howzat. Genesis™ 510 has medium plant height, and moderate resistance to lodging. Genesis ™ 510 is susceptible to phytophthora.

Seed size will predominately be in the 5-6mm (14-17g/100 seeds) range, smaller and darker than Howzat. It is therefore less preferred for whole seed markets.

Agronomic features & disease resistance:

Variety	Type	Seed Weight (g/100)	Main seed sizes (mm)	Seed colour	Flowering time	Maturity time	Plant height	Lodging	Ascochyta blight	Botrytis grey mould	Phytoph-thora
Genesis™ 510	**Desi**	**16**	**5-6**	**brown**	**Mid**	**early-mid**	**medium**	**MR**	**R**	**MS**	**S**
Genesis™ 836	Desi	17	5-6	Medium brown	mid-late	mid-late	tall	MR	MS	MS	MS
Howzat(ϕ)	Desi	21	6-7	light brown	Mid	mid	medium	MS	MS-S	MS	MS
Sonali	Desi	17	5-6	Dark brown	early	early	medium	MS	MS	MS	MS
Almaz(ϕ)	Kabuli	41	8-9	cream	id-late	late	medium	MR	MS-MR	S	S
Genesis™ 079	Kabuli	25	6-7	cream	early	early	short	MR	R	MS	S
Genesis™ 090	Kabuli	30	7-8	cream	mid	mid-late	medium	MR	R	S	S
Kaniva	Kabuli	38	7-9	cream	late	late	medium	MS	VS	VS	VS
Nafice(ϕ)	Kabuli	43	8-9	cream	llate	late	medium	MR	MS-MR	S	S

S = susceptible, **MS** = moderately susceptible, **MR** = moderately resistant, **R** = resistant.

Yield and adaptation:

Genesis™ 510 is released for Western Australia only where it has the highest or equal highest long-term experimental yield among desi varieties, including situations where ascochyta blight is well managed. Genesis™ 509, a very similar variety, is released for south-eastern Australia only because it is a better locally adapted variety.

Genesis™ 510 is susceptible to phytophthora and has inferior grain quality to other varieties more suited to northern NSW and southern Queensland

National Variety Trials – desi trials Long Term Yields as % of Howzat: 2000-2008.

	Southern & Western Australia		Northern Australia	
Variety Name	High rainfall southern	Low rainfall southern and western	High rainfall northern	Low rainfall northern
Amethyst	92 (5)	-	90 (27)	92 (31)
Flipper(Ф)	90 (32)	90 (34)	91 (42)	90 (43)
Genesis™ 079	104 (21)	101 (18)	-	-
Genesis™ 090	99 (66)	92 (59)	-	96 (5)
Genesis™ 425	-	88 (6)	-	89 (5)
Genesis™ 509	100 (75	98 (53)	96 (6)	-
Genesis™ 510	**100 (53)**	**99 (54)**	**98 (6)**	**-**
Genesis™ 836	96 (44)	97 (63)	92 (6)	93 (4)
Howzat(Ф)	100 (79)	100 (68)	100 (43)	100 (41)
Jimbour(Ф)	99 (7)	-	97 (49)	99 (56)
Kyabra(Ф)	97 (4)	98 (6)	98 (31)	99 (41)
Sonali	95 (69)	97 (66)	94 (8)	94 (4)
Yorker(Ф)	94 (35)	91 (43)	92 (45)	91 (47)
Howzat(Ф) yield (kg/ha)	*1467 (79)*	*1142 (66)*	*1824 (43)*	*1590 (41)*

* Numbers in ( ) = site years. Yield data courtesy of Aust Crop Accreditation System – National Variety Trials.
Data also courtesy of SARDI, DPI Vic, NSW DPI, DAFWA before 2005

Grain yield*as a percentage (%) of Sonali in Western Australia trials

Variety	2004	2005	2006	2007*	2008
Genesis™ 510	**95**	**99**	**106**	**136**	**?**
Genesis™ 836	92	95	99	145	?
Sonali	100	100	100	100	?
Howzat(Ф)	96	101	90	-	
Sonali yield (kg/ha)	*2248*	*1762*	*662*	*1005*	*?*

* Yield data is from DAFWA trials managed to minimise ascochyta blight, with grain yields greater than 0.4 t/ha. 2007 only result is Bolgart trial site.

Quality Characteristics:

Seed size will predominately be in the 5-6mm (14-17g/100 seeds) range, smaller and darker than Sonali or Howzat(Ф). It is therefore less preferred for whole seed markets, and segregation from these other desis may occur. It is however suited to splitting markets.

Genesis™ 510

Howzat(Ф)

Management Package

(Consult local grower guides for more detailed information)

This VMP updates and reinforces those management issues with Genesis™ 510 chickpeas that may be different to other chickpea varieties. Refer to existing guides for other general chickpea management issues.

Seeding Date and Rate:

- Sow into wet soil after April 20th in low rainfall areas, and after May 5th in medium rainfall areas. Sowing is not recommended after May in all areas of WA.
- Sow at 35-50 plants/m^2 (75-100 kg/ha, subject to seed size & germination test).
- Group N rhizobia is required for all chickpea varieties to ensure successful nodulation. Be cautious when using fungicide seed treatment as the fungicide can be toxic to seed applied rhizobia. Read the rhizobia and fungicide label for details.

Row Spacing:

Sowing row widths up to 50cm can be used without sacrificing yield and providing greater harvest efficiencies. Stubble cover must however be present to avoid evaporation losses. Genesis™ 510 is of medium height and moderately resistant to lodging, and fits well into systems of inter-row sowing in wider rows into standing stubble.

Herbicide Sensitivity:

Observations in WA and eastern Australia have indicated that Genesis™ 510 shows tolerance to herbicides commonly used in chickpea production including diuron, simazine, metribuzin and isoxaflutole (Balance®). Seasonal effects on herbicide activity occur, so confirmation of herbicide tolerance in Genesis™ 510 is on-going.

Disease Management:

Follow local best management guidelines for your region, e.g. see disease management guides on www.pulseaus.com.au or www.agric.wa.gov.au .

- Close and regular monitoring for ascochyta blight and other diseases is essential to avoid yield losses.
- Use a seed dressing (containing thiram or thiabendazole plus thiram) for the control of seed-borne ascochyta blight and common root rots.
- In WA one fungicide spray containing Chlorothalonil is recommended 4-6 weeks after sowing to protect yield from ascochyta blight. This early spray is not usual practice in south-eastern Australia, but may be in north-eastern Australia.
- In WA under extreme disease pressure, a fungicide spray applied during early flowering and podding, but immediately before rain, will be required to protect yield and grain quality in Genesis™ 510. Ascochyta blight during podding can result in poor quality, discoloured grain or some yield loss.
- Note that south-eastern Australia programs target their foliar fungicide applications at early podding prior to rain ensure pods are protected, and high quality, disease free grain is produced.
- Further fungicide applications during podding may only be required if ascochyta blight is present in the crop in a high risk situation where there is an extended pod filling period and a rainfall event is predicted.

If botrytis grey mould (BGM) is present or it is an area prone to BGM infection, fungicide applications from canopy closure stage will assist in controlling this disease.

Yield loss due to ascochyta blight in research trials where severe ascochyta blight was induced

Variety	Horsham (VIC) 2005 yield (t/ha) Difference of greater than 0.25 t/ha is required for significant differences				Mingenew (WA) 2005 yield (t/ha) Difference of greater than 0.52 t/ha is required for significant differences				
	Nil	Podding	Strategic	Fortnight	Nil	Early	Podding	Early & Podding	Fortnight
Genesis™ 510	**2.02**	**2.28**	**2.33**	**2.26**	**1.69**	**2.64**	**2.34**	**2.69**	**2.50**
Genesis™ 836	1.66	1.84	1.93	2.00	1.17	1.86	1.73	1.86	2.01
Howzat(ϕ)	0.38	0.88	0.82	2.34	0.46	1.29	1.55	1.38	2.42

Nil = no fungicide applied; Vic: Strategic = 5 fungicide applications (6-8 weeks after emergence, mid-late vegetative stage, early podding and mid podding); Fortnight = fortnightly fungicide spray from 8 weeks after sowing; Podding = 1 application at early podding. All applications were 2L/ha of Chlorothalonil (720g/L). WA: Early = 4 weeks after emergence; Podding= single spray at podding; Fortnight = fortnightly fungicide spray from 4 weeks after emergence. All applications were 1.5L/ha of Chlorothalonil (720g/L).

Insect control:

Monitoring and early budworm control is critical with chickpeas. And early detection is important in Genesis™ 510 because of it's early flowering and maturity time.

Frost, cold and heat:

Chickpeas are an indeterminate crop which can have the ability to recover from severe weather events (eg frost and heat) and respond to late spring rains. Genesis 509 has an advantage over Genesis™ 090 or larger kabulis like Almaz(ϕ) in medium and shorter growing areas as it pods earlier and may avoid grain fill under hot dry conditions.

Desiccation and Harvest:

Genesis™ 510 is not suited to either crop topping or weed wiping to prevent weed seed set, particularly ryegrass. Grain yield loss and weed seed set will be severe if early ryegrass escapes proceed through to crop maturity. Desiccation may be beneficial to enable early harvest and ensure desi quality is achieved. Early harvest is recommended to maximise yield and reduce seed staining through weathering, disease and pests.

Harvester settings will need to be similar to that for other desi chickpeas. Consult DAFWA bulletin 4656 "Producing Pulses in the Northern Agricultural Region" page 127, for more detail. Crop lifters should not be required. Wider rows (50-90cm) improve harvest efficiency.

Marketing:

- Because it is a small, darker desi, Genesis™ 510 is likely to be segregated from other larger, lighter coloured desis like Howzat, Jimbour, Flipper, Yorker.
- It is also possible that it could receive prices lower than these other, more sought after desi types, depending on demand.
- Genesis™ 510 has an End Point Royalty (EPR) of $5.50 per tonne (inc GST) marketed which includes management, administration costs and a plant breeder's return.
- Genesis™ 510 grain will be able to be freely marketed to Authorised Trading Companies (ATCs) established through agreements with Australian Agricultural Crop Technologies (AACT).
- ATCs include the majority of pulse trading companies within Australia and are listed on the AACT website. The ATC will deduct EPR from grower payments automatically. Any commercial pulse trading company is welcome to apply to be an ATC.

Seed Availability and PBR:

Genesis™ 510 is available for sowing in Western Australia only. Genesis™ 510 is managed by Australian Agricultural Crop Technologies (AACT). Seed will be covered by a licence and growers will be required to sign a Seed Variety Licence Agreement. Genesis™ 510 seed is available through registered seed re-sellers listed on the AACT website.

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For details on registered seed re-sellers or Authorised Trading Companies contact:
Australian Agricultural Crop Technologies national office:
Ph (02) 6795 3050
or visit the website www.aacroptech.com

Agronomic Enquiries: Contact:

Alan Meldrum (Pulse Aust)	0427 384 760	Wayne Parker (DAFWA, Geraldton)	08 9956 8511
Kristy Hobson (Vic DPI)	03 5362 2111	Ian Pritchard, (DAFWA, Perth)	08 9368 3515
Wayne Hawthorne (Pulse Aust)	0429 647 455	.	

Other Reading: For field chickpea management guidelines, see:

- Grain Legume Handbook 2008
- Pulse Australia publications: "Chickpea disease management strategy for southern region GRDC" and supplements, and "Pulse seed treatments and foliar fungicides" (www.pulseaus.com.au)
- SARDI fact sheet "Chickpea variety sowing guide" www.sardi.sa.gov.au/pdfserve/fieldcrops/research_info/sowing_guide/chickpeas.pdf)
- I&I NSW publications (www.agric.nsw.gov.au): "Winter Crop Variety Sowing Guide" ; Pulse Point 20 "Germination testing and seed rate calculation"; "Weed Control in Winter Crops"; "Insect and Mite Control in Winter Crops";
- Vic DPI "Winter Crop Summary" and fact sheets (www.dpi.vic.gov.au).

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