Genesis™ 090

Small kabuli chickpea

VMP 2011 #11

KEY FEATURES of Genesis™ 090

- **Genesis™ 090 is the "benchmark" ascochyta resistant, small kabuli chickpea in southern Australia.**
- **Broadly adapted with high yield potential.**
- **It is medium flowering and maturing, which makes it suitable for most growing areas.**
- **Resistant to ascochyta blight and requires management similar to other resistant varieties.**
- **Not suitable for crop topping and its height makes it unsuitable for weed wiping.**
- **Suits many farming systems including inter-row sowing into standing stubbles and wider (>30cm) row spacings.**
- **Genesis™ 090 has predominantly 7-8mm seed, which is smaller than Almaz$^{\Phi}$ (8-10mm).**
- **Grain prices will be lower than large kabuli price but usually higher than a desi price.**

Where Genesis™ 090 fits into the farming system:

Genesis™ 090 is a high yielding small kabuli chickpea that has proved to be adapted to most chickpea growing areas of southern and western Australia. It is best suited to farming systems where crop topping or weed wiping of herbicide resistant ryegrass escapes is not required to prevent weed seed set. It does however have to be considered against alternative varieties and marketing types in most areas. It is less suited to northern Australia where phytophthora resistance is important in variety selection.

Variety Characteristics:

Breeding: Genesis ™ 090 (tested as FLIP94-090C) 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 in 2005.

Agronomic Characteristics: Genesis ™ 090 is a high yielding and widely adapted small seeded kabuli chickpea with resistance to ascochyta blight, showing no or minimal yield loss in trials subjected to high ascochyta disease pressure. Its flowering time is earlier, and its plant height shorter than Almaz$^{\Phi}$ in southern Australia. Maturity time is approximately 10 days later than Howzat$^{\Phi}$. Genesis™ 090 has medium plant height and moderate resistance to lodging. It is susceptible to phytophthora.

Seed size will predominately be in the 7 and 8 mm range and other grain quality characteristics are generally consistent with other kabuli chickpea varieties.

Agronomic features & disease resistance:

Variety	Type	Seed Weight (g/100)	Main seed sizes (mm)	Seed colour	Flowering time	Maturity time	Plant height	Lodging	Asco-chyta blight*	Botrytis grey mould	Phytoph-thora
Almaz$^{\Phi}$	Kabuli	41	8-9	cream	mid-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**
Genesis™ 425	Kabuli	32	7-8	Cream	mid	mid-late	medium	MR	R	S	MS
Kaniva	Kabuli	38	7-9	cream	late	late	medium	MS	VS	VS	VS
PBA Boundary$^{\Phi}$	Desi	21	6-7	Light brown	mid	mid	medium	R	R-MR	S	MS-MR
PBA HatTrick$^{\Phi}$	Desi	21	6-7	Light brown	mid	mid	medium	R	MR-R	S	MR
PBA Slasher$^{\Phi}$	Desi	18	6-7	Light brown	mid	mid	medium	MR	R	S	S
Flipper$^{\Phi}$	Desi	18	6-7	light brown	mid-late	mid-late	med-tall	MR	MR	S	MS-MR
Genesis™ 509	Desi	16	5-6	brown	mid	early-mid	medium	MR	R	MS	S
Howzat$^{\Phi}$	Desi	21	6-7	light brown	mid	mid	medium	MS	MS-S	MS	MS
Jimbour$^{\Phi}$	Desi	20	6-7	light brown	mid	mid	med-tall	MR	S	S	MR
Yorker$^{\Phi}$	Desi	21	6-7	light brown	mid-late	mid	medium	MR	MS-MR	S	MR

S = susceptible, **MS** = moderately susceptible, **MR** = moderately resistant, **R** = resistant. * = foliar. All varieties are S on pods & seed.

Yield and adaptation

Genesis™ 090 has been a consistently good yielder in long-term experiments across southern Australia when compared with either desis or other kabulis. Chickpea variety choice ultimately must be based on net return after yield, costs of production and grain price is considered.

National Variety Trials – desi trials Long Term Yields.

South Australia and Victoria as a percentage of PBA Slasher 2003-2010

	Lower EP SA	Upper EP SA	Yorke P SA	Mid North SA	South East SA	Mallee Vic	Wimmera Vic
Genotype	**%**	**%**	**%**	**%**	**%**	**%**	**%**
Genesis079	99 (3)	95 (3)	100 (8)	98 (11)	99 (6)	97 (12)	96 (15)
Genesis090	**90 (6)**	**83 (6)**	**89 (14)**	**88 (17)**	**91 (10)**	**89 (20)**	**91 (23)**
Genesis509	87 (6)	86 (6)	88 (16)	89 (23)	89 (10)	88 (24)	89 (27)
Howzat	94 (6)	86 (5)	89 (15)	89 (220)	91 (9)	90 (22)	86 (25)
PBA_Boundary			91 (6)	90 (11)		91 (8)	91 (10)
PBA_HatTrick	88 (4)	83 (4)	87 (12)	86 (17)	89 (8)	88 (19)	89 (22)
PBA_Slasher	100 (5)	100 (4)	100 (13)	100 (19)	100 (8)	100 (19)	100 (22)
Sonali	90 (5)	90 (4)	89 (12)	87 (17)	90 (7)	84 (17)	81 (19)
Yield of PBA Slasher t/ha	***1.70***	***0.55***	***1.85***	***1.95***	***2.52***	***1.33***	***1.08***

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

Southern NSW and Western Australia as a percentage of PBA Slasher 2003-2010

	S/E NSW	S/W NSW	AgZone 1 WA	AgZone 2 WA	AgZone 4 WA
Genotype	%	%	%	%	%
Flipper	84 (7)	84 (7)	87 (9)	87 (6)	87 (6)
Genesis079			100 (7)	99 (7)	99 (9)
Genesis090	**90 (4)**	**90 (4)**	**88 (13)**	**88 (11)**	**87 (13)**
Genesis509	89 (7)	89 (7)	-	-	-
Genesis510			94 (14)	95 (11)	95 (14)
Genesis 836			93 (12)	94 (11)	95 (14)
Howzat	90 (8)	90 (8)	93 (13)	92 (9)	91 (12)
PBA_Boundary	96 (6)	96 (6)	-	-	-
PBA_HatTrick	91 (5)	91 (5)	92 (12)	93 (9)	93 (13)
PBA_Slasher	100 (5)	100 (5)	100 (8)	100 (8)	100 (11)
Sonali	86 (6)	86 (6)	97 (14)	97 (10)	95 (13)
Yorker	87 (6)	87 (6)			
Yield of PBA Slasher t/ha	*1.35*	*1.35*	*1.23*	*1.03*	*0.94*

* Numbers in ( ) = site years. Yield data courtesy of Aust Crop Accreditation System – National Variety Trials.
** Variety is available only in WA. Data also courtesy of NSW DPI before 2005

National Variety Trials – kabuli trials Long Term Yields as % of Genesis 090: 2003-2010.

South Australia, Victoria and southern NSW as a percentage of Genesis 090 2003-2010

	Lower EP SA	Yorke P SA	Mid North SA	South East SA	Mallee Vic	Wimmera Vic	S/W NSW	S/E NSW
Genotype	**%**	**%**	**%**	**%**	**%**	**%**	%	%
Genesis079	110 (6)	109 (12)	106 (17)	100 (10)	96 (19)	104 (16)	98 (2)	101 (4)
Genesis090	**100 (6)**	**100 (12)**	**100 (17)**	**100 (10)**	**100 (19)**	**100 (16)**	**100 (2)**	**100 (5)**
Genesis425	94 (2)	95 (8)	95 (12)	93 (4)	91 (14)	95 (11)	93 (2)	96 (4)
Almaz	83 (6)	84 (12)	78 (17)	84 (10)	74 (19)	81 (16)	82 (2)	80 (5)
Genesis114	81 (6)	89 (12)	82 (17)	87 (10)	84 (19)	87 (14)	83 (2)	81 (4)
Genesis 115		86 (4)	82 (6)	87 (3)	82 (7)	85 (5)		81 (2)
Yield of Genesis 090 t/ha	*1.36*	*1.64*	*1.59*	*2.27*	*1.02*	*1.23*	*1.63*	*1.35*

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

Quality Characteristics

Genesis™ 090 seeds are small (predominantly 7 to 8mm) and do not attract the premiums paid for larger seeded kabuli grains (8 to 11mm). It is often priced and traded as a commodity, but some marketers may grade them to size in order to market seed sizes separately. Genesis™ 090 is likely to receive desi prices at least, but usually slightly better, depending on demand and seed size produced.

Management Package

(Consult local grower guides for more detailed information)

This VMP updates and reinforces those management issues with Genesis™ 090 chickpeas that may be different to other chickpea varieties. Refer to existing guides for other general chickpea management issues.

Seeding Date and Rate:

- Target the sowing date used for desi chickpeas in your region before ascochyta became a problem. Gains in yield and grain quality can be made from timely sowing.
- Sow at 35-40 plants/sqm (95-150kg/ha, subject to seed size & germination test).
- Inoculate with Group N Chickpea rhizobial inoculum at sowing.

Row Spacing:

Trial work and commercial experience has shown that chickpea's can be grown successfully and harvested efficiently at a range of row spacing's. At the wider spacing's (>30 cm) stubble cover maintained may help avoid evaporation losses. Genesis™ 090 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:

Herbicide tolerance trials in Victoria and South Australia (Wimmera clay and alkaline sandy loam soils) show that herbicides commonly used in chickpea production can be used on Genesis™ 090 with the same degree of safety. Severe seasonal effects on herbicide activity can occur and work is ongoing to validate findings under differing seasonal conditions.

Disease Management:

To minimise yield losses to ascochyta blight, botrytis grey mould and phytophthora, follow local best management guidelines for your region, eg see disease management guides on www.pulseaus.com.au or Departmental web sites. Use a seed dressing (containing thiram or thiabendazole plus thiram) for the control of ascochyta blight, botrytis grey mould and common root rots.

Ascochyta blight disease management with Genesis™ 090 is the same as with the other ascochyta resistant varieties like Genesis™ 509 or Genesis™ 079:

- Fungicide sprays are unlikely to be required before podding, but monitor crops for signs of disease.
- Use a foliar fungicide at early podding prior to rain to ensure pods are protected, and high quality, disease free grain is produced.
- Pods of Genesis™ 090 are more vulnerable to ascochyta blight, and infection can result in poor quality, discoloured grain or seed abortion and yield loss in severe situations.
- Further fungicide applications during podding may 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.

There is a risk of botrytis grey mould infection in Genesis™ 090 if a dense, bulky canopy develops.

- Fungicide applications from canopy closure stage will assist in controlling botrytis grey mould if disease is present or in tall bulky crops in an area prone to infection.

Insect control:

Monitoring and early budworm control is critical with all chickpea crops because of their flowering time, duration and maturity time.

Frost, cold and heat:

In medium to short growing areas, the flowering time of Genesis™ 090 along with its flowering and podding duration, is an advantage over later flowering varieties like Almaz® as grain fill is likely to occur under high temperatures and low soil

Crop topping and Weed wiping:

Genesis™ 090 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 and Harvest:

Desiccation may be beneficial to enable early harvest and ensure kabuli quality is achieved. Harvester settings will need to be similar to that for other small kabuli chickpeas. Early harvest is recommended to maximise yield and reduce seed staining through weathering, disease and pests. Crop lifters should not be required. Wider rows (60-90cm) improve harvest efficiency.

Marketing:

Genesis™ 090 is often priced and traded as a commodity, but some marketers grade them to size for marketing seed sizes separately. It is likely to receive prices lower than larger seeded varieties like Almaz®, but higher than very small kabulis like Genesis™ 079. As a guide, Genesis™ 090 is likely to receive at least desi chickpea price, but usually better depending on demand.

- Genesis™ 090 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™ 090 grain can 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™ 090 is widely available, being commercialised through 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 ™ 090 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

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Other Reading:

For field chickpea management guidelines, see:

- Grain Legume Handbook 2008
- Pulse Australia publications: "Chickpea disease management strategy for southern region GRDC" and "Pulse seed treatments and foliar fungicides" (www.pulseaus.com.au)
- SARDI fact sheet "Chickpea variety sowing guide 2012" www.sardi.sa.gov.au/pdfserve/fieldcrops/research_info/sowing_guide/chickpeas.pdf)
- NSW DPI publications (www.agric.nsw.gov.au): "Winter Crop Variety Sowing Guide 2012" ; Pulse Point 20 "Germination testing and seed rate calculation"; "Weed Control in Winter Crops 2011"; "Insect and Mite Control in Winter Crops";
- Vic DPI "Winter Crop Summary 2011" and fact sheets (www.dpi.vic.gov.au).

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