Genesis™ 079

Small Kabuli Chickpea

VMP 2010 #03

KEY FEATURES of Genesis™ 079

- **A small seeded kabuli (predominantly 6-7mm) with smaller seed than Genesis™ 090 (predominantly 6-7mm)**
- **Improved adaptation to short season environments due to earlier flowering and earlier maturity than current varieties**
- **Highest yields in short season environments than current varieties**
- **Resistant to foliar ascochyta blight**
- **Early maturity and uniform short plant height offers improved potential for agronomic weed control options under some conditions**
- **Budget for grain prices at lowest end of small kabuli range due to 6-7mm seed**

Where Genesis™ 079 fits into the farming system:

Genesis™ 079 is a high yielding chickpea, and has proved to be adapted to most chickpea growing areas of southern and Western Australia. It is likely to fit into farming systems where crop topping or weed wiping of herbicide resistant ryegrass escapes is common practice in other pulses to prevent weed seed set. It does however have to be considered carefully against alternative varieties and marketing types in medium or higher rainfall areas, or in areas prone to early frosts and low temperatures during pod set.

Genesis™ 079 could replace field peas in areas where frosts or high temperatures during flowering affect pea grain yield. It is less suited to northern Australia where phytophthora resistance is important in variety selection.

Variety Characteristics:

Breeding: Genesis ™ 079 (tested as FLIP94-079C) 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 in 2009 as part of the National Chickpea Breeding Program.

Agronomic Characteristics: Genesis ™ 079 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 Genesis™ 090 in southern Australia. Seed size will predominately be in the 6 and 7 mm range and other grain quality characteristics are generally consistent with other kabuli chickpea varieties. Genesis ™ 079 is susceptible to phytophthora.

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(◊)	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™ 114	Kabuli	39	8-9	Cream	mid-late	late	medium-tall	R	MS-MR	S	VS
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
Genesis™ 509	Desi	16	5-6	brown	mid	early-mid	medium	MR	R	MS	S
Howzat(◊)	Desi	21	6-7	light brown	mid	mid	medium	MS	MS-S	MS	MS
PBA HatTrick	Desi	20	6-7	light brown	mid	mid	medium-tall	R	MR	S	MR
PBA Slasher	Desi	18	5-6	light brown	mid	mid	medium	MS	R	S	S

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

Yield and adaptation

Genesis™ 079 has consistently yielded higher than Genesis™ 090 in long-term experiments across southern Australia. Genesis™ 079 is specifically suited to areas where short crop height and early maturity are important.

National Variety Trials – desi trials Long Term Yields: 2002-2009.

	% Genesis 836	% Genesis 509					
	Western Australia	South Australia				Victoria	
Variety Name	Ag Zone 1,2 & 4	Eyre Peninsula	Yorke Peninsula	Mid North	South East	Wimmera	Mallee
Genesis™ 079	**104 (16)**	**112 (5)**	**111 (6)**	**108 (9)**	**109 (5)**	**100 (12)**	**103 (9)**
Genesis™ 090	91 (33)	99 (4)	97 (15)	96 (18)	101 (13)	97 (24)	97 (22)
Genesis™ 509	-	100 (16)	100 (17)	100 (22)	100 (13)	100 (28)	100 (24)
Genesis™ 510	102 (32)	-	-	-	-	-	-
Genesis™ 836	100 (41)	-	-	-	-	-	-
PBA HatTrick	98 (27)	99 (7)	96 (10)	94 (14)	98 (7)	96 (19)	97 (15)
PBA Slasher	105 (20)	113 (8)	110 (11)	109 (16)		106 (19)	109 (15)
Genesis™836 yield (kg/ha)	1132 (41)	-	-	-	-	-	-
Genesis™509 yield (kg/ha)	-	1099 (16)	1260 (17)	1547 (22)	2229 (13)	926 (28)	969 (24)

* Numbers in ( ) = site years. Yield data courtesy of NVT, PBA, SARDI, DPI Vic, DAFWA, I&I NSW.

National Variety Trials – kabuli trials Long Term Yields as % of Genesis™ 090: 2003-2009.

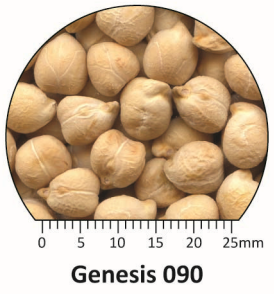
	South Australia				Victoria		New South Wales	
Variety Name	Eyre Peninsula	Yorke Peninsula	Mid North	South East	Wimmera	Mallee	South	North
Almaz(ф)	83 (6)	83 (11)	75 (16)	83 (9)	70 (17)	75 (14)	82 (8)	82 (22)
Genesis™ 079	**113 (7)**	**114 (13)**	**110 (18)**	**102 (12)**	**99 (20)**	**104 (19)**	**103 (8)**	**98 (24)**
Genesis™ 090	100 (8)	100 (14)	100 (18)	100 (13)	100 (20)	100 (19)	100 (11)	100 (24)
Genesis 114	82 (6)	89 (11)	81 (16)	86 (9)	82 (17)	84 (12)	83 (7)	100 (31)
Genesis™ 425	94 (4)	94 (11)	94 (14)	92 (8)	87 (17)	92 (16)	94 (9)	92 (34)
Nafice(ф)	77 (5)	82 (9)	72 (13)	79 (7)	64 (14)	67 (12)	72 (7)	78 (17)
Genesis™ 090 yield (kg/ha)	1460 (7)	1462 (13)	1408 (18)	2295 (13)	939 (20)	946 (19)	1400 (11)	1761 (14)

* Numbers in ( ) = site years. Yield data courtesy of NVT, PBA, SARDI, DPI Vic, I&I NSW.

Quality Characteristics

Genesis™ 079 is a small kabuli (6 to 7mm) so its grain will not attract the premiums paid for larger seeded kabuli grains (8 to 11mm). It is most likely to be traded as a bulk commodity rather than being graded to size for marketing. Genesis™ 079 is likely to receive prices lower than slightly bigger seeded varieties like Genesis™ 090. Realistically, Genesis™ 079 is more likely to receive desi prices, depending on seed size and demand.

Genesis 079



Genesis 090

Genesis 114

Management Package

(Consult local grower guides for more detailed information)

This VMP updates and reinforces those management issues with Genesis™ 079 chickpeas that may be different to other chickpea varieties. Refer to existing guides for other general chickpea management issues.

Seeding Date and Rate:

- Target a sowing rate to give the same plants per square metre as other desi or small kabuli chickpeas.
- Sow at similar times as used for chickpeas in your region now and before ascochyta blight became a problem. Gains in yield and grain quality can be made from timely sowing.
- Avoid sowing too early in medium and longer growing season areas to ensure flowering and podding is under warm conditions.
- 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™ 079 is shorter than other chickpea varieties, so increased height from inter-row sown in wider rows into standing stubble may be an advantage.

Herbicide Sensitivity:

Herbicide tolerance trials in Victoria and South Australia (Wimmera clay and alkaline sandy loam soils) show that herbicides commonly used in Genesis™ 090 chickpeas can be used on Genesis™ 079 with the same degree of safety. Severe seasonal effects on herbicide activity occur, so 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™ 079 is the same as with the other ascochyta resistant varieties like Genesis™ 090 or Genesis™ 509:

- 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™ 079 can be affected by ascochyta blight, and this 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 less risk of botrytis grey mould infection in Genesis™ 079 because of the less bulky canopy.

- 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 chickpeas, and early detection will be important in Genesis™ 079 will be important because of it's early flowering time and short flowering duration.

Frost, cold and heat:

The early flowering of Genesis™ 079 and its short flowering and podding duration is an advantage in short growing seasons. However, in medium and longer growing season areas, it could flower and pod in colder, frostier periods if sown too early.

Crop topping and Weed wiping:

Genesis™ 079 matures early enough in some seasons to be crop-topped to prevent weed seed set, particularly ryegrass. Even in bulky crops, ryegrass seed heads will emerge above the shorter canopy, hence weed wiping in Genesis™ 079 has been successful. Grain yield loss will however be severe if early ryegrass escapes proceed through to almost crop maturity.

Timing of either practice must target the ryegrass stage, so care is required to ensure that chickpea grain quality is not affected when the chickpeas are less mature than desirable at the time.

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.

Marketing:

- Genesis™ 079 is likely to be traded as a bulk commodity rather than being graded to size for marketing.
- It is likely to receive prices lower than varieties like Genesis™ 090, and more likely to receive desi prices or slightly lower, depending on seed size and demand.
- Genesis™ 079 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™ 079 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™ 079 will be available for sowing in 2011, and is 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 ™ 079 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 supplements, and "Pulse seed treatments and foliar fungicides" (www.pulseaus.com.au)
- SARDI fact sheet "Chickpea variety sowing guide 2010" 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 2010" ; Pulse Point 20 "Germination testing and seed rate calculation"; "Weed Control in Winter Crops 2010"; "Insect and Mite Control in Winter Crops";
- Vic DPI "Winter Crop Summary 2010" and fact sheets (www.dpi.vic.gov.au).

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