

Canola cultivar evaluation:
Western and Southern Cape 2020

By PJA Lombard, L Smorenburg, and J Strauss

During the 2020 season, a total of 14 canola cultivars were tested in the cultivar evaluation programme. Among these were four conventional, four CI (Clearfield, imazamox tolerant), and five of the TT group (triazine tolerant) cultivars. A combination-type cultivar (Hyola 580CT) that is tolerant to both CI and triazine, was included in the trials for a second year.

As a result of the challenges faced in 2020, no new cultivars could be tested; however, all were hybrids.

Climate

Rainfall on the Langgewens Research Farm in the Swartland was 12mm less than the long-term average. The temperatures, along with the rainfall, in all probability created the ideal circumstances for vegetative development up until July. Maximum temperatures from May to June were 1,3 to 2,4°C higher than the long-term average. Canola plants are extremely susceptible to high temperatures, especially during the process of flowering up until the completion of seed filling. During this time, the maximum (1,1°C) and minimum temperatures (1,4°C) were lower than the long-term average.

However, the average rainfall for the growing season was 92mm more than the long-term average of 244mm. The average temperature in August was 1,6°C (maximum) and 1,4°C (minimum) lower than the long-term average. Both the maximum and minimum temperatures were lower during October, which meant that temperatures in the Overberg were favourable for seed filling. The confluence of climate conditions in 2020 resulted in a high seed yield.

Results

Yield results for the various areas are summarised in *Table 1*. Data from the CI and TT cultivars is indicated separately from the conventional cultivars. The new combination-type cultivar, Hyola 580CT, is included in the TT group.

In the Swartland, the average yield per trial varied from 3 324kg/ha^{-1} (first planting at Langgewens) to 2 269kg/ha^{-1} at Hopefield. The CI cultivars 44Y90 (4 072kg/ha^{-1}) and 43Y92 (3 570kg/ha^{-1}) delivered the highest yield for the first and second sowing, respectively, at Langgewens. The two conventional cultivars Diamond (3 367kg/ha^{-1}) and Quartz (3 318 kg/ha^{-1}) had the highest average yield in the Swartland.

Table 1: Swartland and Southern Cape seed yield for 2020 (kg/ha^{-1}).

Cultivars 2020	Langgewens 1	Langgewens 2	Hopefield	Tygerhoek 1	Tygerhoek 2	Riversdale	Napier	Average
Planting date	11 May (rain 25 May)	2 June	18 May (rain 25 May)	7 May	22 May	20 May	9 June	
	kg/ha^{-1}	kg/ha^{-1}	kg/ha^{-1}	kg/ha^{-1}	kg/ha^{-1}	kg/ha^{-1}	kg/ha^{-1}	kg/ha^{-1}
Hyola 50	2 826^{d}	3 430^{abcd}	2 343^{abcd}	3 111^{defgh}	3 575^{def}	3 819^{def}	3 142^{defg}	3 166de
Diamond	3 579^{ab}	3 513^{abc}	3 009^{ab}	3 427^{cdef}	3 891^{abcde}	4 202^{bcd}	3 380^{bcdef}	3 572^{bc}
Tango	2 712^{d}	2 874^{e}	2 035^{bcde}	3 030^{efgh}	3 316^{ef}	3 729^{def}	2 881^{fg}	2 940^{ef}
Quarts	3 668^{a}	3 203^{abcde}	3 084^{a}	3 613^{bcd}	4 291^{ab}	4 649^{ab}	3 275^{cdef}	3 683^{ab}
Conventional avg	**3 196**	**3 255**	**2 618**	**3 295**	**3 768**	**4 100**	**3 170**	**3 340**
43Y92	3 934^{a}	3 570^{a}	2 650^{abc}	3 489^{cde}	3 595^{cdef}	4 626^{ab}	3 783^{bc}	3 664^{ab}
45Y93	3 756^{a}	3 513^{ab}	2 111^{bcde}	4 062^{ab}	4 396^{a}	4 710^{a}	4 542^{a}	3 870^{a}
45Y91	3 773^{a}	3 335^{abcde}	2 777^{ab}	4 159^{a}	3 955^{abcd}	4 459^{ab}	3 968^{ab}	3 775^{ab}
44Y90	4 072^{a}	3 550^{ab}	2 681^{ab}	3 754^{abc}	4 181^{abc}	4 414^{abc}	3 973^{ab}	3 804^{ab}
CI average	**3 884**	**3 492**	**2 555**	**3 866**	**4 032**	**4 552**	**4 067**	**3 778**
Alpha TT	3 497^{abc}	3 015^{bcde}	2 078^{bcde}	3 541^{bcde}	3 496^{def}	3 957^{cde}	3 525^{bcde}	3 301^{cd}
Hyola 555 TT	2 789^{d}	2 938de	1 686de	2 588^{h}	3 149^{f}	3 409^{f}	2 848^{fg}	2 772^{f}
Hyola 559 TT	2 832^{d}	3 129^{abcde}	2 366^{abcd}	3 043^{efgh}	3 675^{bcdef}	3 514^{ef}	2 640^{g}	3 028^{def}
Hyola 350	2 956^{cd}	3 327^{abcde}	1 487^{e}	2 857^{gh}	3 112^{f}	3 718^{ef}	2 978^{efg}	2 919^{ef}
Hyola 650	3 079^{bcd}	2 977^{cde}	1 634de	3 135^{defg}	3 217^{f}	3 838^{def}	3 601^{bcd}	3 069de
Hyola 580CT	3 069^{bcd}	2 928de	1 826^{cde}	2 927^{fgh}	3 263^{f}	3 592^{ef}	3 264^{cdef}	2 981^{ef}
TT average	**3 037**	**3 052**	**1 846**	**3 015**	**3 319**	**3 671**	**3 143**	**3 012**
Trial average	**3 324**	**3 236**	**2 269**	**3 338**	**3 651**	**4 045**	**3 414**	**3 325**

**Cultivars marked with the same letter do not differ significantly.*

Table 2: Traits of the cultivars tested from 2018 to 2020. (Data obtained from the *Australian Blackleg Management Guide Fact Sheet, 2014 to 2020*).

Cultivar	Type	Company	Year of first test	Growth period: Days until flowering, 2019/20	Days until flowering, Langgewens, 2018/19	Yield (% of trial average), Swartland, 2019/20	Yield (% of trial average), Rûens, 2019/20	Blackleg index	Blackleg index + Jockey^{j} / Saltro^{s}/ Ilevo^{i}	Blackleg resistant group #
Hyola 50	Conv	K2 Seed	2009	Late	Late	99	93	r^{2016}	r$^{2016(j)}$	AD
CB Tango	Conv	Agricol	2013	Early*	Early*	93	93	ms^{2014}	mr$^{2014\ (j)}$	B
Diamond	Conv	Agricol	2015	Early	Early	119	108	mr^{2020}	r$^{2020\ (jsi)}$	ABF
Quartz	Conv	Agricol	2018	Semi-early	Semi-early	117	115	r^{2020}	r$^{2019\ (j)}$	ABD
44Y90	CL	Pioneer	2016	Medium	Semi-early	110	112	r^{2020}	r$^{2020\ (jsi)}$	B
45Y91	CL	Pioneer	2016	Late	Late	106	106	r-mr^{2020}	r$^{2020\ (jsi)}$	B
43Y92	CL	Pioneer	2017	Semi-early	Semi-early	115	110	r^{2020}	r$^{2020\ (i)}$	B
45Y93	CL	Pioneer	2019	Late^{2019}	Late^{2019}	102	110	r^{2020}	r$^{2020\ (si)}$	BC
Hyola 555 TT	TT	K2 Seed	2011	Semi-early	Semi-early	84	85	mr^{2014}	r$^{2014\ (j)}$	D
Hyola 559 TT	TT	Barenbrug	2014	Semi-early	Medium	93	86	r^{2020}	r$^{2020\ (s)}$	ABD
Hyola 650 TT	TT	Barenbrug	2017	Medium	Medium	86	93	r^{2017}	-	ABD
Alpha TT	TT	Agricol	2017	Semi-early	Semi-early	99	99	ms-mr^{2018}	r$^{2018\ (j)}$	BF
Hyola 350 TT	TT	K2 Seed	2018	Early	Early	92	90	r^{2020}	r$^{2020\ (jsi)}$	ABDF
Hyola 580 CT	CI & TT	Barenbrug	2019	Semi-early^{2019}	Medium^{2019}	85	89	r^{2020}	r$^{2020\ (jsi)}$	BC

r = resistant; mr = mildly resistant; ms = mildly susceptible; s = susceptible. ** Slow to germinate (adjusted dates).* *Seed treatment: Jockey = j, Saltro = s and Ilevo = i.*

The TT cultivar Alpha (2 863kg/ha^{-1}) had the highest average yield in the Swartland, followed by Hyola 559 TT (2 776kg/ha^{-1}). The average yield of the TT cultivars was 13% (26% in 2019) and 22% (9% in 2019) less in 2020, compared to the conventional and CI cultivars. The yield of the CI cultivars was on average 9% more than the yield of the conventional group of cultivars.

In the Rûens, the average yield varied between 4 045kg/ha^{-1} at Riversdale, and 3 015kg/ha^{-1} at Tygerhoek Research Farm during the first planting date. The yield of the first planting was negatively influenced by irregular germination. Average yield was 3 704kg/ha^{-1} compared with 1 678kg/ha^{-1} in 2019.

Due to the lengthy growing season, the CI cultivar that had a longer growing season, delivered the highest yield in the trials. The average yield of 45Y93 was 4 549kg/ha^{-1}. The cultivar with the second highest yield in 2020 was also a CI cultivar, namely 44Y90.

The conventional cultivar Quartz (4 072kg/ha^{-1}) delivered the highest average yield in the conventional group, as well as in the Southern Cape, as was the case in 2019.

It was followed by Diamond (3 824kg/ha^{-1}), which had the highest yield in 2017. In the TT group, Alpha TT (3 659kg/ha^{-1}) had the highest yield, followed by Hyola 650TT (3 552kg/ha^{-1}) in second place, and the combination cultivar Hyola 580CT (3 373kg/ha^{-1}) in third. The average yield of TT cultivars was 8 and 23% lower than the conventional and CI cultivars, respectively. In 2019, variation in the Southern Cape was 20 and 12%, while conventional cultivars had a 20% difference.

The traits of the cultivars are summarised in *Table 2*. Take note that various agents have been added to the blackleg index. The average seed yield of two seasons gives a better indication of the expected yield of a cultivar than a single season, as was the case in 2020, which had a record season in commercial terms.

In conclusion

The climate of the 2020 season had a positive effect on production. Due to the cooler weather in August and September, the growing season lasted longer than usual. In contrast, though, the 2019 season was unusually dry with record high temperatures measured in September, which greatly affected yield. In 2020, the yield at corresponding localities was 67 and 133% more in the Swartland and Southern Cape, respectively. The 2019 and 2020 seasons highlight the severe impact that climate change can have on production in the Western Cape.

For more information, send an email to PJA Lombard at pietl@elsenburg.com.

