



Yield Realization of Different *Brassica* Cultivars under Central Plain Zone of Punjab

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ABSTRACT

The experiment was laid out using randomized block design with 8 treatments and 3 replications during rabi 2016-17. Treatments comprised of 8 cultivars of Brassica sown at the KVK Kapurthala farm in order to evaluate the yield potential of these cultivars under central plain zone of Punjab conditions. The crop was sown on 10th November 2016 and harvested during 1st fortnight of April 2017. The study revealed that minimum duration was taken by YSH 0401 (141.0 d) and maximum by RH 749 (154.9 d). The data also showed that there was no significant difference in seed yield levels between 4 cultivars (RH 406, NRCDR 2 and NRCHB 101 and GSC 7), whereas, these were significantly higher yielder than other cultivars. Productivity on per day basis was calculated and found that maximum productivity was observed in NRCHB 101 (15.5 kg/ha/d) and lowest in YSH 0401 (9.1 kg/ha/d).

Keywords: Brassica, Cultivars, Maturity, Productivity, Punjab, Seed yield

INTRODUCTION

In India, Rapeseed and mustard (*Brassica* spp.) is the second most important edible oilseed after groundnut sharing 27.8 per cent in India's oilseed economy with 32 per cent of the total oilseed production in the country (Thakur and Sohal, 2014). Brassicaceae family consists of 338 genera and 3709 species. The production and yield of rapeseed and mustard increased from 6.66 MT and 1017 kg/ha in 2000-01, the country witnessed yellow revolution through a phenomenal increase in production and productivity to 7.66 MT and 1185 kg/ha in 2010-11 (Singh and Kothari, 2013).

To meet the ever growing demand of oil in the country, the gap is to be bridged through management techniques. Optimum crop geometry, balanced NPK fertilizers, intercultural operations and inclusion of farmyard manure are the building blocks for achieving the utmost yield targets of rapeseed-mustard. Effective management of natural resources, integrated approach to plant-water, nutrient and pest management and extension of rapeseed mustard cultivation to newer areas under

different cropping systems will play a key role in further increasing and stabilizing the productivity and production of rapeseed-mustard to realize 24 MT of oilseed by 2020 A.D.

Despite the high quality of oil and also its wide adaptability for varied agro-climatic conditions, the area, production and yield of rapeseed-mustard in India have been fluctuating due to various biotic and abiotic stresses coupled with India's domestic price support programme due a vast variability in climatic and edaphic conditions in mustard growing areas of India, so, the selection of appropriate cultivars is important for increasing the productivity (Anjum et al, 2005).

The tremendous increase in oilseed production could be attributed to development of high yielding cultivars coupled with improved production technology, their widespread adoption and good support price. Sometimes, selection depends upon the quality of the produce, as; Gobhi Sarson cultivars such as GSC 6 and GSC 7 became popular among the farmers due to less than 2 per cent erucic acid content. These are a long

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duration cultivars confined to Haryana, Punjab and Himachal Pradesh. It had good yield potential with wide adaptability and possesses high oil content of good quality (Shekhawat *et al*, 2012). Therefore an effort was made to evaluate the yield realization of different *Brassica* cultivars under central plain zone of Punjab.

MATERIALS AND METHODS

Six cultivars of Brassica were procured from Directorate of Rapeseed and Mustard, Bharatpur, Rajasthan (DMR) during rabi 2016-17 and two Gobhi Sarson cultivars (GSC 6 and GSC 7) released from PAU, Ludhiana were evaluated at the KVK Kapurthala farm in order to assess the yield potential of these cultivars under Punjab conditions (Table 1). The experiment was laid out using randomized block design with 8 treatments and 3 replications. The seeds were sown on 10th November 2016 at 30 cm row to row spacing by hand drill. Two thinning operations were done at 15 and 30 days after sowing (DAS), whereas, two hand weeding were done at 25 and 40 days after sowing. The fertilizers were applied in quantity @ 225 kg of urea and 187.5 kg of single super phosphate (SSP) per ha. Half amount of the urea and full dose of SSP were applied at the time of sowing and remaining half of the urea was applied at 25 days after sowing. One application of Confidor @ 100ml/ha was done

in 250 of water at 100 DAS in order to control attack of aphid and jassids and Ekalux was sprayed @ 625 ml/ha for control of tobacco caterpillar at 45 and 120 DAS. The experimental plot was harvested on 4 to 14th April 2017, depending upon the maturity of cultivar. The seed yield data were calculated and analyzed by using online OPSTAT software (Sheoran *et al*, 1998).

RESULTS AND DISCUSSION

The study revealed that all the cultivars were of different duration varying between 141-155 d. Minimum duration was taken by YSH 0401 (141 d), although GSC 6 was also early maturing cultivar with 145.3 d required for maturity (Table 2). Maximum duration was taken by RH 749 (154.9 d), which was statistically at par with GSC 7 (154 d).

On comparing the yield realized from different cultivars (Table 2), it was observed that maximum seed yield was obtained with RH 406 (23.4 q/ha) followed by NRCDR 2 (22.8 q/ha) and NRCHB 101 (22.8 q/ha). the data also revealed that there was no significant difference between 3 cultivars of DRMC (RH 406, NRCDR 2 and NRCHB 101) and one cultivar of PAU (GSC 7) with 21.4 q/ha, whereas, these were significantly higher yielded than other cultivars namely DRMRIJ 31 (21.2 q/ha), RH 749 (16.1 q/ha), GSC 6 (14.9 q/ha) and YSH 0401 (12.8 q/ha).

Table 1. Information on Brassica cultivars used under study.

Sr. No.	Variety	Common Name	Botanical Name	Developing Institute	Oil content (%)
1	RH 406	Indian Mustard	<i>Brassica juncea</i> L.	CCS HAU, Hisar	40.0
2	NRCDR 2	Indian Mustard	<i>Brassica juncea</i> L.	DRMR, Bharatpur	36.5-42.5
3	NRCHB 101	Indian Mustard	<i>Brassica juncea</i> L.	DRMR, Bharatpur	34.6-42.1
4	GSC 7	Gobhi Sarson	<i>Brassica napus</i> L.	PAU, Ludhiana	40.5
5	DRMRIJ 31	Indian Mustard	<i>Brassica juncea</i> L.	DRMR, Bharatpur	42.0
6	RH 749	Indian Mustard	<i>Brassica juncea</i> L.	CCS HAU, Hisar	39.0
7	GSC 6	Gobhi Sarson	<i>Brassica napus</i> L.	PAU, Ludhiana	39.1
8	YSH 0401	Indian Mustard	<i>Brassica rapa</i> L. var. Yellow Sarson	CCS HAU, Hisar	43.0-45.0

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Table 2. Seed yield obtained from different *Brassica* cultivars.

Sr. No.	Variety	Time taken to maturity (Days)	Yield (q/ha)	Productivity (kg/ha/d)
1	RH 406	153.1	23.4	15.3
2	NRCDR 2	148.0	22.8	15.4
3	NRCHB 101	146.7	22.8	15.5
4	GSC 7	154.0	21.4	13.9
5	DRMRIJ 31	152.3	21.2	13.9
6	RH 749	154.9	16.1	10.4
7	GSC 6	145.3	14.9	10.3
8	YSH 0401	141.0	12.8	9.1
	C.D.	0.9	2.1	1.4

As the time taken for maturity varied for 14 days and there was difference in seed yield obtained as well in different cultivars of *Brassica* (Table 2). In order to conclude precisely, productivity on per day basis was calculated and found that maximum productivity was observed in NRCHB 101 (15.5 kg/ha/d) followed by NRCDR 2 (15.4 kg/ha/d), RH 406 (15.3 kg/ha/d), GSC 7 (13.9 kg/ha/d), DRMRIJ 31 (13.9 kg/ha/d), RH 749 (10.4 kg/ha/d), GSC 6 (10.3 kg/ha/d) and lowest in YSH 0401 (9.1 kg/ha/d).

CONCLUSION

Minimum time taken to maturity was with YSH 0401 followed by GSC 6 and maximum by RH 749, GSC 7 and RH 406. Out of 7 cultivars, 3 cultivars of DMR, viz., RH 406, NRCDR 2 and NRCHB 101 was statistically at par with GSC 7 in seed yield. Moreover, GSC 7 variety of *Brassica* is canola type and had higher oil quality which is most suitable for human consumption. These 3 cultivars from DMR were having statistically higher productivity per ha per day as compared to all other cultivars. So, these 3 cultivars can be further evaluated at farmer's field to increase adaptability of these cultivars in central plain zone of Punjab. In order to popularize these cultivars popular among farmers, there is a need to establish mini agro processing units at the village level, so that farmers can sell their raw produce in the village itself. It is worth to mention that infact there is MSP declared by Govt of India for oilseed

crops but there is no purchaser in the market at the prescribed MSP, as a result of which there is great difficulty in convincing the farmer to adopt this crop in place of other rabi crops especially wheat.

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