

Punjab state - The potential canola oil hub of country

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Enhancing farm income is the focus of current agricultural systems. This requires cultivation of highly productive crop varieties with superior end product quality. Growing canola quality rapeseed- mustard varieties could contribute significantly in enhancing income of farmers growing rapeseed-mustard in NW India, especially Punjab. Punjab is the only state in country growing canola varieties on significant area of approx. 20,000 ha, primarily in central districts of Punjab. Breeders at Punjab Agricultural University have been able to develop several canola quality varieties of rapeseed mustard under the leadership of National Professor S.S.Banga. These include GSC 6 and GSC 7 of *Gobhisarson* and RLC3 of Indian mustard (Rai). Of these, GSC-7 has proved a great hit among farmers. This variety is an ideal blend of high productivity (average yield 2.2tons/ha) and high canola quality of international standards. This variety is capable of producing over 3.0 tons/ha under timely sown and irrigated conditions over a range of real farm conditions in Punjab and adjoining areas of Haryana. Although the variety is recommended for irrigated ecologies, it does well under limited irrigation as well. Another canola variety, GSC 6 yields 1.5 tons/ha, but it matures in 145 days, which is about 7- 9 days earlier than GSC 7 (154 days) and 10-14 days earlier than the non-canola varieties such as GSL 1 which mature in 160 days. GSC 6 is, thus, especially suited for rice/maize-canola *Gobhisarson*-green gram cropping sequence. The inclusion of green gram crop will also take care of soil fertility. Canola oil from GSC 7 possess

62.2% oleic acid (MUFA), 30.2% PUFA, 0.5% erucic acid and 14.5 umoles/g defatted cake. Thus oil and meal from GSC 7 are compliant with international standards for canola quality laid by Canola Council of Canada. PAU has also developed yellow seeded canola quality Indian mustard variety named RLC 3. Its oil content is 41% and is resistant to white rust. It yields 1.8 tons/ha. Its seeds contain about 41.5 per cent oil with 42.3% oleic acid, 35.3% linoleic acid, 11.5% linolenic acid whereas, defatted cake contains about 15.0 μ moles glucosinolates /g of defatted meals. It takes 145 days to mature. Meal of canola quality varieties can be effectively used as a supplement for poultry feed, besides its traditional use as a cattle feed.

Canola oil has the lowest saturated fat level among all vegetable oils. Saturated fats are supposed to raise the bad cholesterol (LDL) in our body and have been linked to coronary heart diseases. The potential health benefits of conventional canola oil, hence, are largely due to its relatively low saturated fatty acids (about 7%) and high amounts of MUFA (about 60 to 62%). In addition, canola oil has sufficient amount of two essential poly unsaturated (PUFA) fatty acids viz. alpha-linolenic acid (omega-3) and linoleic acid (omega-6). Oil from canola varieties has high smoking point and hence very suitable for high temperature cooking as well. Unlike in PUFA rich varieties, there is very little production of trans fats during high temperature cooking.

There is sizeable increase in area under this variety in Punjab over last two years. Aside high productivity, stability and high canola quality, GSC-7 has advantage over hybrid Hyola 401 as farmers can use their self-saved seed for next year if no other *Gobhisarson* variety is growing in vicinity. PAU sells GSC-7 seed at a nominal rate of Rs. 120/kg, which is about 8-9 times lower than the market rate of hybrid, Hyola 401. Timely sown GSC-7 offer attractive returns to farmers that equals or even exceeds wheat at lower production costs.

With increase in health awareness, urbanization and per-capita consumption, the demand for canola oil is increasing steadily. India has imported 0.37 million tonnes of canola oil at the cost of about 326 millions dollars to meet burgeoning requirements during year 2016-2017. Many private companies selling imported canola oil at MRP 180 to 220 per litre. In spite of tremendous research efforts and good adoption by farmers, our farmers are not availing any benefit and whole money is being drained to foreign

countries. Cheap imports are also encouraging profiteering by importers due to very low duty tariffs and selling canola oil in the Indian market at twice the price of normal mustard oil. This is hurting domestic growers due to low selling price and millers as a consequence of under-utilization of installed capacities. There is a need to announce and actually implement separate MSP for premium quality canola on the lines of Basmati. Solvent extractors can benefit by dovetailing with cattle and poultry feed industries. Part of profits can be passed on to farmers. There is also a case for contract farming to ensure regular supplies to the millers.

Keeping in demand of canola oil of the country, if about 5 Lakh ha area under wheat (about 14-15% of wheat cultivated area) is replaced by cultivation of canola varieties along with proper policy and market support, Punjab state has potential to meet the demand of canola oil of the entire country. Along with good quality canola oil of international standards, this will also make available 6.9 lakh tonnes good quality defatted cake. There is huge export potential of oilcake in India but high level of glucosinolates (100-120 μ moles/gm defatted meal) is resulting in exports at lower prices. Double zero canola varieties offer the dual benefit to millers : (i) extraction of canola oil for sale in Indian markets at premium price and (ii) use for local poultry/cattle feed industry or export of oil cake at higher price. PAU bred canola varieties are not genetically modified (Non-GMO) and there should be no perceived concern for honey bee industry. Punjab State can emerge as hub for canola oil in Indian market and start up for Yellow Health Revolution.

PAU has launched canola oil "PAUola" as pilot experiment and received very good response from consumers. The technical knowhow and economics for canola oil extraction is being provided to progressive farmers/entrepreneurs as continuous effort and yielding good results.

The characteristic features of *Gobhisarson* and mustard canola varieties are presented in Table 1 and 2, respectively.

Table 1: Characteristics features of GSC 7 and GSC 6

Character	GSC 7	GSC 6
Year of release	2014	2007
Seed yield (t/ha)	2.23	1.9
Oil content (%)	40.5	39.1
Oil yield (t/ha)	0.9	0.74
Days of Maturity	154	145
Erucic acid (%)	0.5	1.0
Glucosinolates (umoles/g defatted meal)	14.5	22

Table 2 : Characteristics features of RLC 3

Character	RLC 3
Year of release	2015
Seed yield (t/ha)	1.83
Oil content (%)	41.5
Oil yield (t/ha)	0.76
Days to maturity	145
Plant height (cm)	172
Erucic acid (%)	0.8
Glucosinolates (umoles/g defatted meal)	15

The present status and future production potential pertaining to canola variety GSC-7 is presented in Table 3 and 4, respectively.

Table 3 : Present Production of canola variety GSC-7 in Punjab

Area (ha)	Productivity (t/ha)	Production (t)	Per cent Oil extraction	Quantity of oil Production (ton)	Oilseed cake (%)	Quantity of oilseed cake Production (tons)
20,000	2.25	45,000	Approx. 38	17,100	Approx. 62	27,900

Table 4 : Future Production potential of canola variety GSC-7 in Punjab

Area (ha)	Productivity (t/ha)	Production (lakh tons)	Per cent oil extraction	Quantity of oil Production (lakh tons)	Oilseed cake (%)	Quantity of oilseed cake Production (lakh tons)
5.0 lakh	2.25	11.25	38	4.3	62	6.97

