

# Spring Sunflower PSFH-118 at Ludhiana (PB) and HSFH-848 Hybrid at Hisar (HR) for Oil Quality and Seed Yield in India

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## Abstract

The Field trials on sunflower crop were conducted in different states of India during the year from 2006 to 2008. The RSFPD, Government of India, DADF provided all inputs to conduct the trials in the area under their jurisdiction to evaluate the suitable varieties vs hybrids of sunflower, their sowing season, irrigations vs rainfed conditions of cultivation including other agronomic package of practices. Government of India has strong feed and fodder development organization. There are several centrally sponsored schemes like establishment of fodder banks, development of forage crops through biotechnology research, minikits distribution in the country. Central government distributed latest variety seeds in the country to a tune of cost of Rs 7.00 crores through eight RSFPDs. The sunflower is a multi-purpose crop and may be good source of animal feeds as a un-conventional feed resource. Sunflower can be grown with forage crops also. RSFPDs organized sunflower trials in different states to evaluate sunflower production in northern and southern parts of India. The varieties and hybrids released by AICRP (Sunflower) for different regions were selected for field trials. India has tropical and subtropical climate from south to north, respectively. Tamilnadu and Maharashtra face the tropical while, Haryana, Punjab and Uttar Pradesh experience a sub-tropical type of climate having February and March as spring season in Northern India. All India released hybrid PSFH-118 and HSFH-848 were grown at Ludhiana in Punjab and Hisar in Haryana. Variety HSFH-848 performed better with seed yield (1702.1 and 1734.1 kg/ha) over the seed yield of HSFH-118. Data shows that oil content (37.7, 38.3%) was higher in the seeds of cultivar PSFH-118. Maximum plant height (164.6, 167.9 cm) recorded in HSFH-848 and head diameter (16.2-17.1 cm) was at par in both the varieties of hybrid sunflower.

**Keywords:** Sunflower, Yield, Irrigation, Seed, Oil, Plant height, Hybrid, Hisar, Ludhiana

## 1. Introduction

Sunflower (*Helianthus annuus* L.) is an important oilseed crop in India. The name "Helianthus" is derived from 'Helios' meaning 'sun' and 'anthos' meaning 'flower'. It is known as sunflower as it follows the sun by day, always turning towards its direct rays. It is one of the fastest growing oilseed crops in India. In early 1970s, only about 0.1 million hectares were under sunflower cultivation, however by 2002-03, it had gone up to 1.63 million hectares. In India, it was used mainly as ornamental crop but in recent past it became an important source of edible and nutritious oil. Sunflower is a major source of vegetable oil in the world. It is used for a variety of cooking purposes (Singh et al., 1987). Sunflower seed contains about 48-53 percent edible oil. The sunflower oil is considered premium compared to other vegetable oil as it is light yellow in colour, high level of linoleic acid and absence of linolenic acid, possesses good flavour and high smoke point. Sunflower oil is a rich source (64 percent) of linoleic acid which is good for heart patients. Linoleic acid helps in washing out cholesterol deposition in the coronary arteries of the heart. The oil is also used for manufacturing hydrogenated oil. Sunflower is also a source of lecithin, tocopherols and furfural. It is used as nutritious meal for birds and animals. It is also used in the preparation of cosmetics and pharmaceuticals (Singh et al., 1995) grown all over the world is originated from former USSR. In India, sunflower as an oilseed crop introduced in 1969.

Sunflower seeds are one of the most nutritious and healthy foods. Sunflower is described as "drenched with sunlight" because the head follows the sun, ending up facing the west "to absorb the few last rays of the dying sun". India is one of the largest producers of oilseed crop in the world. Oilseeds occupy an important position in the Indian agricultural economy. Our country accounted for 4.77 percent (1250 thousand MT) of total world production of sunflower in 2004. Due to source of high quality edible oil, sunflower oil is used as cooking oil in different recipes. Its importance increases as sunflower oil is considered as a heart friendly oil. Besides oil, almost every part of sunflower has commercial value. It is used in the manufacturing paints, resins, plastics,

soap, cosmetics and many other industrial products. Sunflower as an oilseed is a newly introduced crop in the country. This crop has gained importance due to its short duration of maturity, containing of excellent quality of oil, photo-insensitivity, wide adaptability into different kinds of cropping pattern, high-energy hull and drought tolerance. It is a short duration crop and can be incorporated in different type of cropping pattern. Sunflower is grown as inter cropping with crops such as Groundnut, Pigeonpea, Castor, Soybean and Urd bean. Since it is a photo-insensitive crop, it can be grown throughout the year. Oil cake is rich in high quality protein (40-44 percent) and used as cattle and poultry feed. This crop is considered valuable from economic as well as ornamental point of view.

## 2. Material and Methods

**Pantnagar location (UA):** Table 1: **Morden** Variety was released in the year of 1978 by AICRP (Sunflower) Centre University of Agricultural Sciences, Bangalore, areas of adaptation/recommended ecology, in all sunflower growing states of India. **GAUSUF-15**-Year of release-1993, notification number-408(E), 04-05-1995, developed by AICRP (Sunflower) centre, Amreli Junagadh Agricultural University, Junagadh, pedigree-selection through mutation breeding, areas of adaptation/recommended ecology, all states of India. **TNAUNSUF-7**-Year of release-1995, notification number-408(E), 04-05-1995, developed by AICRP (Sunflower) centre, Tamil Nadu Agricultural University Coimbatore, pedigree, derivative of Dwarf × Surya, areas of adaptation/recommended ecology, all states of India. **DRSF-108**-Year of release-2004, notification number-122(E), 02-02-2005, developed by Indian Institute of Oilseeds Research, Hyderabad, pedigree, selection from gene pool, areas of adaptation/recommended ecology, rainfed areas of all sunflower growing states of India. **DRSF-113**-Year of release-2007, notification number-1703 (E), 05-10-2007, developed by Indian Institute of Oilseeds Research, Hyderabad, pedigree, selection from gene pool, areas of adaptation/recommended ecology, rainfed areas of all sunflower growing states. The sunflower trails were raised as per recommended agronomic package of practices. Treatments were followed as per the technical programme. Two hybrids viz PSFH-118 and HSFH-848 were grown in PB and HR in spring season to study the effect of different locations in India.

## 3. Results and Discussion

### 3.1 Effect of Spring Sunflower Hybrid at Different Locations in Two States—Effect of Soil and Climate

**Ludhiana location Pb:** Table 2: Variety **PSFH-118**-Year of release-2004, Notification number-161(E), 04-02-2004, Developed by AICRP (Sunflower) centre, Punjab Agricultural University, Ludhiana, Pedigree, CMS-10A × P-61-R, Areas of Adaptation/Recommended, ecology, Spring areas of Punjab. **Hisar-HSFH-848**-Year of release-2005, Notification number-1566(E), 05-11-2005, Developed by AICRP (Sunflower) centre, Chaudhary Charan Singh Haryana, Agricultural University, Hisar, Pedigree, CMS-91A × RHA-298, Areas of Adaptation/Recommended ecology, Spring areas of Haryana.

Table 2. Performance of Spring Sunflower PSFH-118, Ludhiana and HSFH-848 hybrids at Hisar under irrigated conditions-2006-8

Year	Variety Hybrid	Pl. ht. (cm)	Days of flow.	Days to Maturity	Head dia. (cm)	100 Seeds wt. (g)	VW (g)	Seed yield (kg/ha)	% Oil	Hull %
2007L	PSFH-118	156.6	58.3	95.3	18.2	4.7	41.6	1640.5	37.7	35.2
	HSFH-848	164.9	60.2	88.1	17.9	3.8	42.4	1702.1	37.4	32.9
2008H	PSFH-118	153.6	58.2	94.5	17.2	3.7	39.6	1513.5	38.3	35.3
	HSFH-848	167.9	57.0	89.7	18.1	3.8	41.4	1734.1	36.4	41.9
Mean		160.7	58.4	91.9	17.9	4.0	41.3	1647.5	37.5	36.3
CD at 0.05		4.3	3.2	2.2	1.7	1.2	4.1	6.2	3.4	2.8

Data given in Table 4 shows that spring sunflower PSFH-118 lower seed yield (1640.5, 1513.5 kg/ha) whereas sunflower HSFH-848 cultivar produced more yield kg/ha (1702.1, 1734.1 kg/ha) at Ludhiana and Hisar respectively. Soil condition, root zone water regime and date of sowing influence the crop productivity as reported by Singh and Gupta (2000, 2001 and 2003).

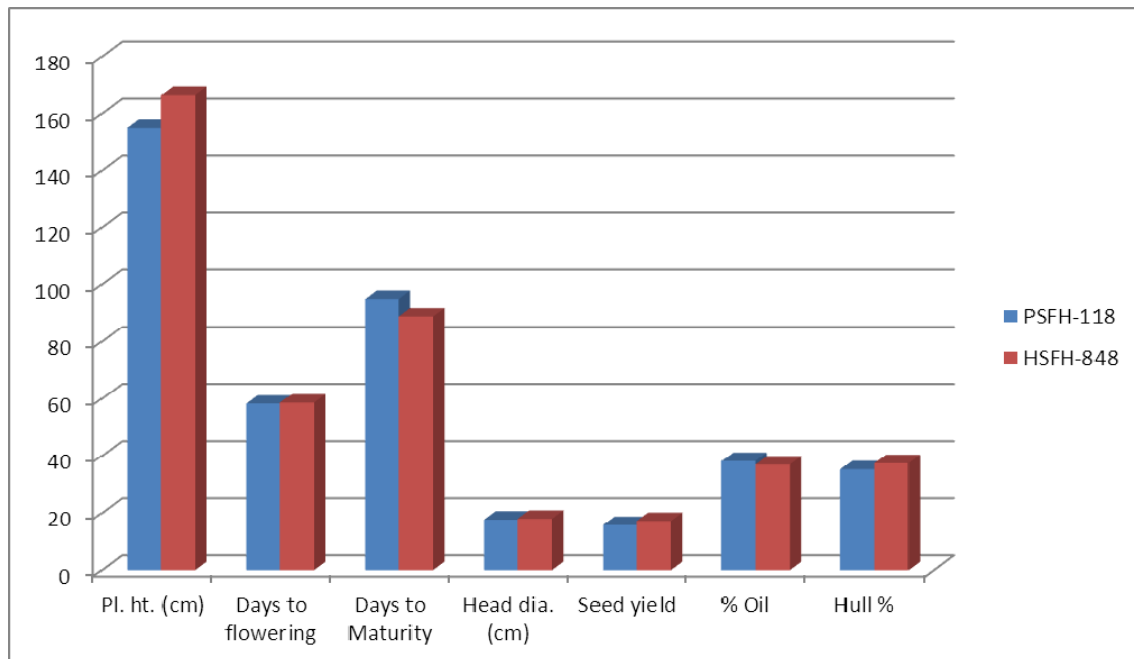


Figure 2. Performance of Spring Sunflower PSFH-118, ludhiana and HSFH-848 hybrids at Hisar (pooled data for two years, 2006-2008)



#### 4. Conclusion

It is concluded that HSFH-848 produced higher seed yield under irrigated conditions at Hisar in Haryana and under irrigated conditions. Hybrid PSFH 118 performed significantly lower seed yield at Ludhiana in Punjab. HSFH-848 may be recommended for better seed yield under irrigated in spring conditions. Hybrid sunflower PSFH-118 found suitable for oil yield at different locations under irrigated conditions in rabi-spring season. During spring season HSFH-848 hybrid sunflower produced more yield at Hisar in northern India, where spring winters-summer season February-March is recorded. As no spring is observed in southern India.

#### References

- Harbir, S., & Om, S. (1987). Response of Late Sown Wheat to Seed Rate and Nitrogen. *Indian Journal of Agronomy*, 32(3), 290-291.
- Om, S. (2004). Response of Sunflower (*Helianthus annuus*) to Date of Sowing and Irrigation. *Agronomy Digest* 4(DELENG/2002/12781), 39-40.
- Om, S., & Gupta, P. C. (2002). Effect on seed vigour and soil-moisture content of spring sunflower (*Helianthus annuus*) hybrid and yield influenced by sowing time and irrigation. *Indian Journal of Agronomy*, 47(3), 433-438.

- Om, S., & Gupta, P. C. (2002). Effects of sowing time and irrigation on phenology and growing degree days of spring sunflower (*Helianthus annuus*). *Indian Journal of Agricultural Science*, 72(7), 424-427. <https://doi.org/10.59797/ija.v47i3.3184>
- Om, S., & Gupta, P. C. (2002). Influence of sowing date and irrigation levels on hybrid seed production and oil quality of sunflower (PSFH-67). *Journal of Oilseeds Research*, 19(2), 204-206.
- Om, S., & Gupta, P. C. (2003). Effect of sowing date and irrigation levels on physiological parameters in relation to growth of spring sunflower (*Helianthus annuus*). *Indian Journal of Agricultural Science*, 73(3), 169-171.
- Om, S., & Gupta, P. C. (2003). Sowing Date and Irrigation Scheduling Effects on Nutrient Uptake and Yield of Spring Sunflower (*Helianthus annuus* L.). *Indian Journal of Ecology*, 30(2), 221-227.
- Om, S., & Sharma, K. L., & Das, S. K. (1995). Phosphorus and Sulphur Availability in Soil Following in Corporation of Various Organic Residues. *Journal of the Indian Society of Soil Science*, 43(2), 223-228.