

Lavender (*Lavandula angustifolia*) Variety  
**‘Him Aarohi’**  
(CSIR-IHBT-LOH15141)



Lavender (*Lavandula angustifolia* Miller) is a high value medicinal and aromatic plant belongs to family Lamiaceae. The essential oil obtained from lavender is generally used in the cosmetics and fragrance industries. Nowadays, the demand of natural products is increasing and the essential oil market is estimated to increase with a compound annual growth rate of ~ 9% from 2019–2026. It is the most important species in the genus due to the higher properties of its essential oil. The glandular hairs (oil glands) are present on the surface of calyx which are the source of essential oil. Therefore, flower spikes are economically crucial for EO extraction. The spike yield and essential oil content of lavender varies with location, developmental stage, and environmental factors, including temperature and rainfall. The lavender plant was introduced to Kashmir in the early 1980s. Later since 2000, it is being grown in Chamba, Himachal Pradesh. However, there is a scanty of superior and stable genotypes of Lavender, particularly for Himachal Pradesh. Therefore, superior clones selected based on fresh spike yield from newly generated variation through hybridization were evaluated along with check at multi- locations in Himachal Pradesh.



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## 'Him Aarohi' (CSIR-IHBT-LOH15141)

The variety 'Him Aarohi' of Lavender has been developed by CSIR-Institute of Himalayan Bioresource Technology, Palampur through hybridization and clonal selection approach. The CSIR-IHBT- LOH15141 is a F<sub>1</sub> clone developed by hybridization between 'SeK-1' and 'No9'. The variety was selected for higher spike yield and essential oil content. This F<sub>1</sub> clone "CSIR-IHBT-LOH15141" has significantly higher spike yield (3.03 kg/plot) and essential oil content (12.59 g/kg) than the check (2.63 kg/plot and 11.37 g/kg) and population mean (2.60 kg/plot and 11.38 g/kg) in Himachal Pradesh.



'Him Aarohi' cuttings in nursery

### Morphological characters of 'Him Aarohi' in mid to high hills of Himachal Pradesh

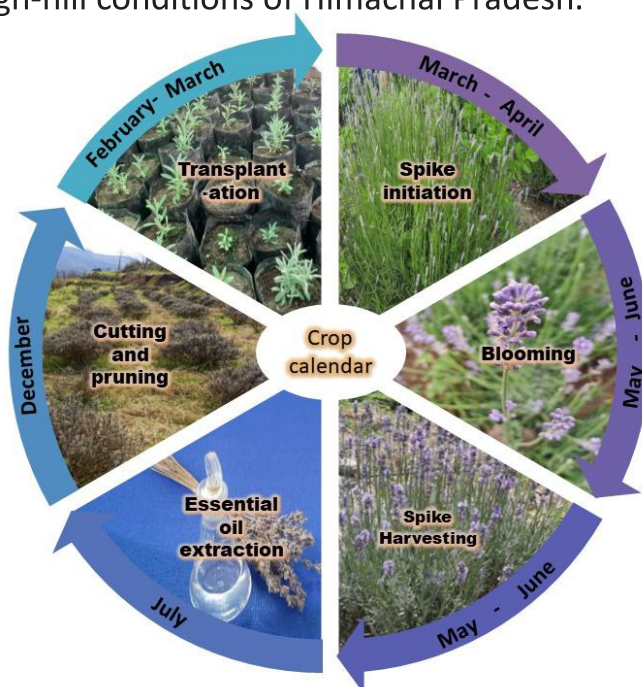
Characters	Him Aarohi	Check	Overall mean
Plant height (cm)	48.32	45.63	44.06
Number of spikes	15.74	14.69	14.34
Spike length (cm)	20.98	19.51	18.94
Spike yield (kg/plot)	3.03	2.63	2.6
Essential oil (g/kg)	12.59	11.37	11.38

### Statement of Distinction

The identified selection 'Him Aarohi' (CSIR-IHBT- LOH15141) has spike yield advantage of 15% and 17% over the check and population mean, respectively. It also has essential oil yield advantage of 11% over both check and population mean. The clone CSIR-IHBT-LOH15141 has an average spike length of 20.98 cm, and 48.32 cm of plant height. It has an average of 16 spikes per plant. It has stable performance for spike yield and essential oil content over different locations in mid- to high-hill conditions of Himachal Pradesh.

### Cultivation practices for 'Him Aarohi'

Lavender cultivation in mid to high hill regions of Himachal Pradesh can be rewarding due to favorable climate. Lavender is a temperate plant with at least 6-8 hours of direct sunlight daily. Lavender prefers low to moderate rainfall but ensure good drainage to prevent root rot during rains. Well-drained sandy or loamy soil slightly alkaline to neutral pH (6.5 to 7.5) is best for 'Him Aarohi' cultivation. The best time of transplantation is in spring (March to April). During plantation maintain a spacing of 60-75 cm between plants and 1-1.5 meters between rows. 'Him Aarohi' is required regular watering during the initial establishment phase.



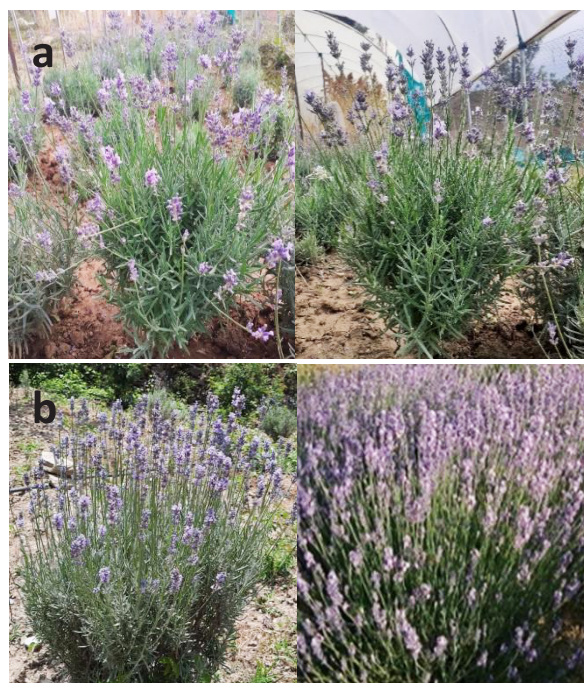
Crop growth calendar of lavender in mid-high hills of Himachal Pradesh



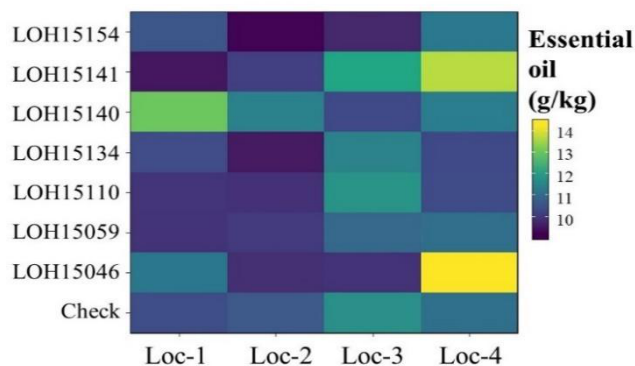
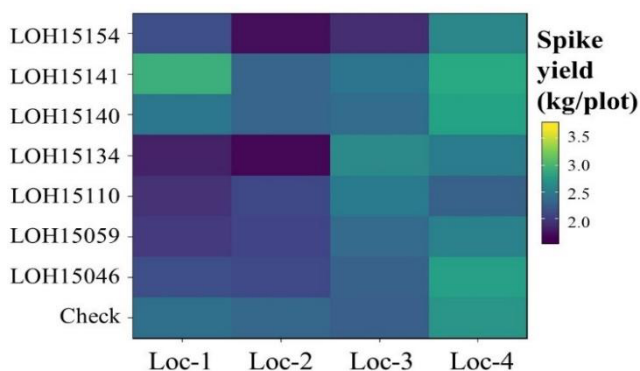
Apply fertilizer in early spring and possibly again in mid-summer to this variety and regularly remove weeds to reduce competition. Harvest flowers spikes when they are fully open, usually in mid-summer (May-June). Prune dead or damaged stems annually after the flowering season to maintain shape and promote healthy growth.

### Comparative performance of ‘Him Aarohi’ at multi-location in Himachal Pradesh

Rooted cuttings of seven superior selections along with a commercial check were planted in paired rows of 3 meters by keeping 100 cm row to row and 50 cm plant to plant spacing in a randomized block design (RBD). The experiments were laid out at four different locations. The experimental sites lay from 1210 to 3400 m above mean sea level. All the studied location falls under the mid-hill sub humid to high-hill temperate dry zones of Himachal Pradesh in western Himalayas. The physiochemical properties of soil varied from acidic silty clay loam to alkaline light sandy loam. The selection “CSIR-IHBT-LOH15141” is recorded significantly higher spike yield and essential oil content at all four locations in Himachal Pradesh.



‘Him Aarohi’ bloom during 1<sup>st</sup> year (a) and 2<sup>nd</sup> year onwards (b)



Comparative representation of spike yield and essential oil content of ‘Him Aarohi’ (LOH15141) with other potential selections at multi-locations



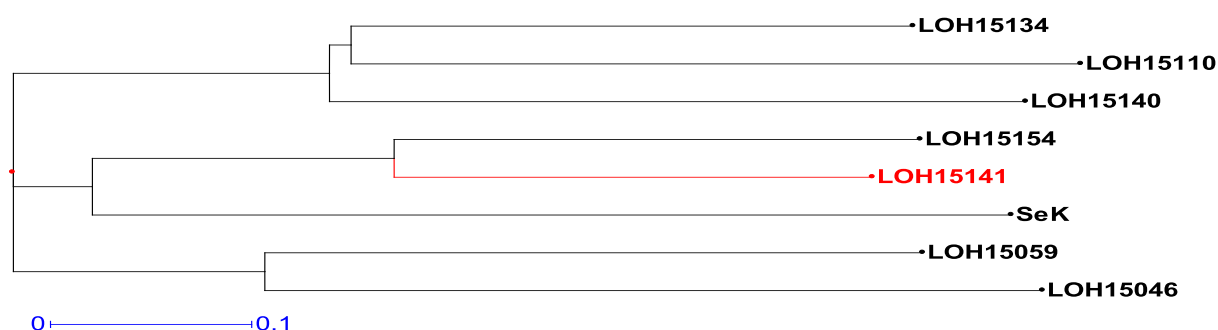
Field view of vegetative growth of ‘Him Aarohi’ in Himachal Pradesh conditions

## Molecular characterization of 'Him Aarohi' (CSIR-IHBT-LOH15141)

Genetic distinctness of variety 'Him Aarohi' (CSIR-IHBT-LOH15141) was established using SSR markers. Seven potential clones namely, LOH15046, LOH15059, LOH15110, LOH15134, LOH15140, LOH15141, LOH15154 with a check were used for comparison. In total, 69 alleles were detected ranging from 3 to 9 with an average of 4.3 alleles per SSR locus. Nine SSR markers evincing reproducible polymorphic loci among lavender clones were used for development of fingerprints. Based on the SSR data, consolidated DNA fingerprints were developed with rare or unique marker loci. Cluster analysis of all eight genotypes grouped in three groups. The selection LOH15141 clustered with check. In conclusion, genetic similarity data based on SSR markers suggested that clonal selection LOH15141 has captured high level of genetic diversity and can be potentially used as promising parental group for future genetic improvement programmes.

## DNA fingerprints of potential selections

SSR Markers	LOH15046	LOH15059	LOH15110	LOH15134	LOH15140	LOH15141	LOH15154	Check
LAF19_135	■							■
LAF19_147			■			■		
LAF19_153					■			
LAF19_157		■					■	
LINT1_202	■							
LINT1_196		■		■				
LINT1_198			■		■			
LINT1_206								■
LINT5_215	■				■			
LINT5_217			■			■		
LINT5_199				■				■
LINT5_208		■			■			
LAF20_204	■							■
LAF20_188		■			■			
LAF20_198						■		
LAF20_268				■				■
LAL4_190	■							■
LAL4_194			■					
LAL4_206						■		
LAL4_214				■				■
LINT6_275	■		■					
LINT6_263				■				
LINT6_287		■			■		■	
LINT6_247								■



## Genetic relationship of 'Him Aarohi' (LOH15141) with other potential selections

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