

WELCOME

Committed to prosperity through aroma





COLLEGE OF HORTICULTURE
V.C.S.G. UTTARAKHAND UNIVERSITY OF HORTICULTURE & FORESTRY
BHARSAR, PAURI GARHWAL, UTTARAKHAND – 246 123

INDUSTRIAL ATTACHMENT

(Horticulture work experience) HWE101



Submitted by:-

- 1.Rahul Semwal (13003)***
- 2.Anil Rana (13014)***
- 3.Saurabh Bhatt (13029)***
- 4.Digvijay Singh Chauhan (13039)***

Submitted to:-

Er. Tejas A. Bhosale



**Location of Centre for
Aromatic Plant (CAP)
(Government of
Uttarakhand)
Industrial Estate Selaqui
- 248011, Dehradun ,
Uttarakhand**

सगन्ध पौधा केन्द्र (कैप)
Centre for Aromatic Plants (CAP)

उत्तराखण्ड सरकार
Govt. of Uttarakhand
इण्डस्ट्रियल स्टेट, सेलाकुई-248011, देहरादून (उत्तराखण्ड), भारत
Industrial Estate, Selaqui-248011, Dehradun, (Uttarakhand), India
टेलीफोन नं. 91-135-2698305, ई-मेल: cap.dun@gmail.com, www.capuk.in

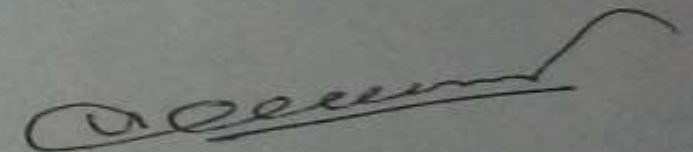
Date: 28-01-2017

TO WHOM IT MAY CONCERN

This is to certify that **Mr. Saurabh Bhatt**, student of B.Sc. (Hons.) Horticulture (4th Year) of College of Horticulture, V.C.S.G Uttarakhand University of Horticulture & Forestry, Bharsar, Pauri Garhwal has successfully completed 1 month training on "Cultivation and Processing of Aromatic Crops" from 26th December, 2016 to 24th January, 2017 at Centre for Aromatic Plants (CAP), Selaqui, Dehradun under the guidance of Dr. S. Zafar Haider, Research Associate, CAP, Selaqui, Dehradun.

He possesses good moral character and was laborious and sincere during his training work.

I wish him all success in future endeavors.



(Dr. Nirpendra Chauhan)
Scientist-In-charge
& HOD

Scientist-In-Charge
Centre for Aromatic Plants (CAP)
Department of Horticulture, Govt. of Uttarakhand
Selaqui, Dehradun

INTRODUCTION

CAP

- ✓ **Centre for Aromatic Plants(CAP) ,Govt. of Uttarakhand was established in 2003 at Selaqui , Dehradun.**
- ✓ **The vision of CAP is to establish Uttarakhand's identity in aromatic oils at National and International level and to establish leadership in mountain specific production , value addition and marketing.**
- ✓ **CAP aims at the betterment of inhabitant through research and extension based advocacy of sustainable use of aromatic plants.**

OBJECTIVES OF CAP

- ✓ Promotion of conservation , cultivation , processing , quality assessment and to develop market linkages of aromatic plants and products.
- **SERVICES PROVIDED BY CAP:-**
 - ❖ Survey and Identification.
 - ❖ Awareness and Training.
 - ❖ Production of quality planting material.
 - ❖ Cultivation and Extension.
 - ❖ Linkages with industries.
 - ❖ Distillation facilities.
 - ❖ Marketing of essential oils and aromatic plants.

INTERACTION WITH SCIENTISTS CO-INCHARGE



IDENTIFICATION OF DIFFERENT AROMATIC PLANTS





वन तुलसी
VAN TULSI

Bot. Name	<i>Ocimum gratissimum</i> L.
Family	Lamiaceae
Part used	Leaves & Inflorescence
Uses	Skin diseases, Cough, Fever etc.



लेमनग्रास
LEMONGRASS

Bot. Name	<i>Cymbopogon flexuosus</i> Stapf.
Family	Poaceae
Variety	KRISHNA
Part used	Leaves
Uses	Herbal Tea, Vitamin A, Detergents etc.

SOIL SAMPLING



Visit to Artemisia field



Taking soil sample from plots



Filling of soil in polybags





Arrangement of soil samples according to accession number

NURSERY PREPARATION



Seeds of Artemisia



Mixing of seeds with fine sand



Spreading of seeds in trays



Addition of coco-peat

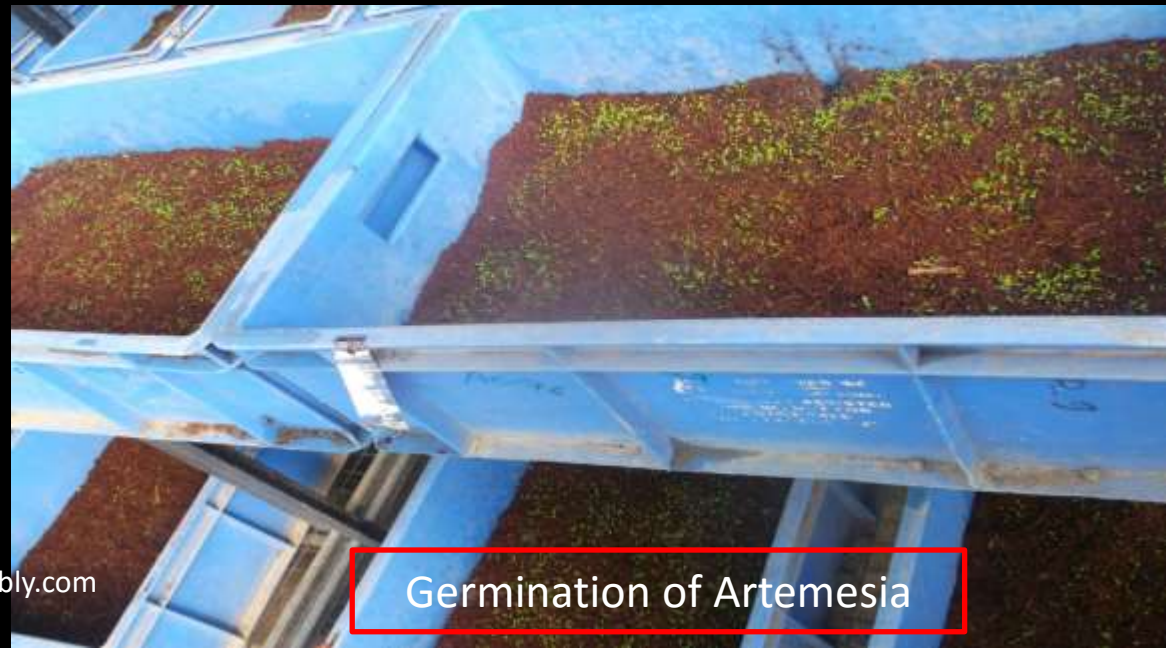


Irrigation



Tagging

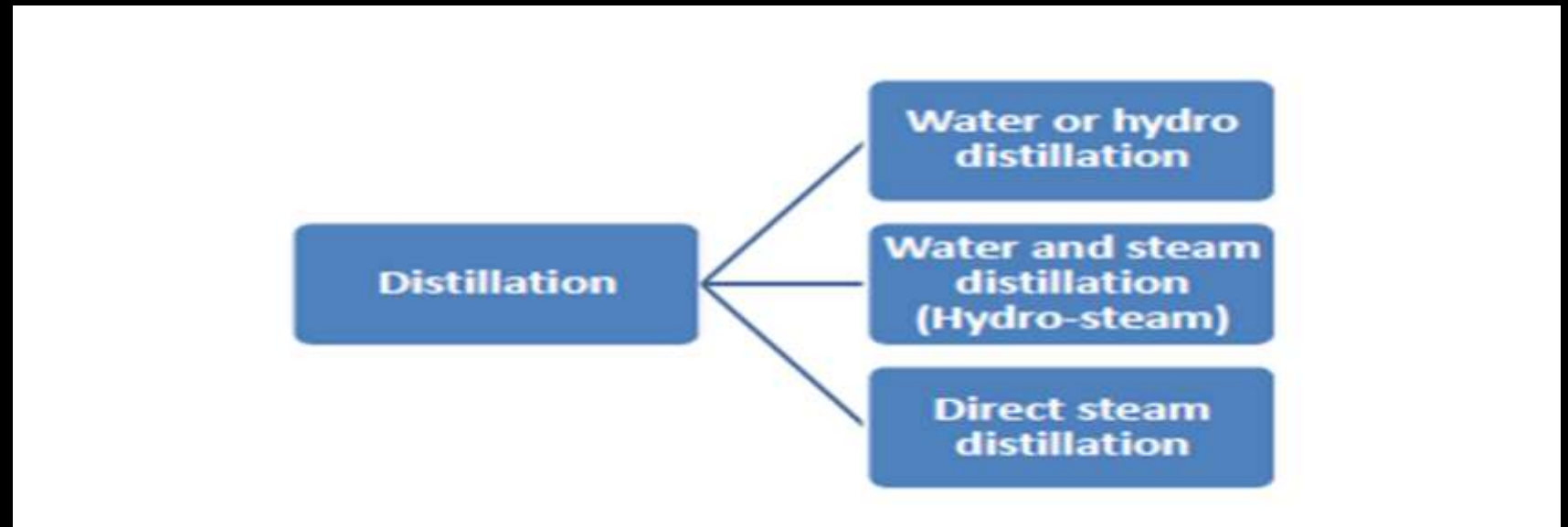
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Germination of Artemesia

• Distillation

In this process the aromatic plant material is packed in a still and a sufficient quantity of water is added and brought to a boil; alternatively, live steam is injected into the plant charge. Due to the influence of hot water and steam, the essential oil is freed from the oil glands in the plant tissue. The vapor mixture of water and oil is condensed by indirect cooling with water. From the condenser, distillate flows into a separator, where oil separates automatically from the distillate water. There are three types of distillation for isolating essential oils from plant materials:



1. Hydrodistillation

In this method, the material is completely immersed in water, which is boiled by applying heat by direct fire. The main characteristic of this process is that there is direct contact between boiling water and plant material.

2. Water and Steam Distillation

In water and steam distillation, the steam can be generated either in a satellite boiler or within the still, although separated from the plant material. Like water distillation, water and steam distillation is widely used in rural areas. Moreover, it does not require a great deal more capital expenditure than water distillation. Also, the equipment used is generally similar to that used in water distillation, but the plant material is supported above the boiling water on a perforated grid. In fact, it is common that persons performing water distillation eventually progress to water and steam distillation.

3. Direct Steam Distillation

As the name suggests, direct steam distillation is the process of distilling plant material with steam generated outside the still in a satellite steam generator generally referred to as a boiler. As in water and steam distillation, the plant material is supported on a perforated grid above the steam inlet. A real advantage of satellite steam generation is that the amount of steam can be readily controlled. Because steam is generated in a satellite boiler, the plant material is heated no higher than 100° C and, consequently, it should not undergo thermal degradation. Steam distillation is the most widely accepted process for the production of essential oils on large scale. Throughout the flavor and fragrance supply business, it is a standard practice. An obvious drawback to steam distillation is the much higher capital expenditure needed to build such a facility.

HYDRO-STEAM DISTILLATION METHOD



Filling of water in unit



Selection of plants for oil extraction



Filling into the distillation
unit
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closing of the unit with proper care



Fitting of other parts



Heat is given



Collection of the oil



Oil extraction unit for large quantity of planting material



Visit to farmer field for raw material (lemongrass)





Filling of raw material



Burning of fuel

EXTRACTION OF LEMON GRASS ANIMATED VIDEO





Extraction of lemon grass oil

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EXTRACTION OF VETIVER OIL (KHUS)



Field view of khus grass

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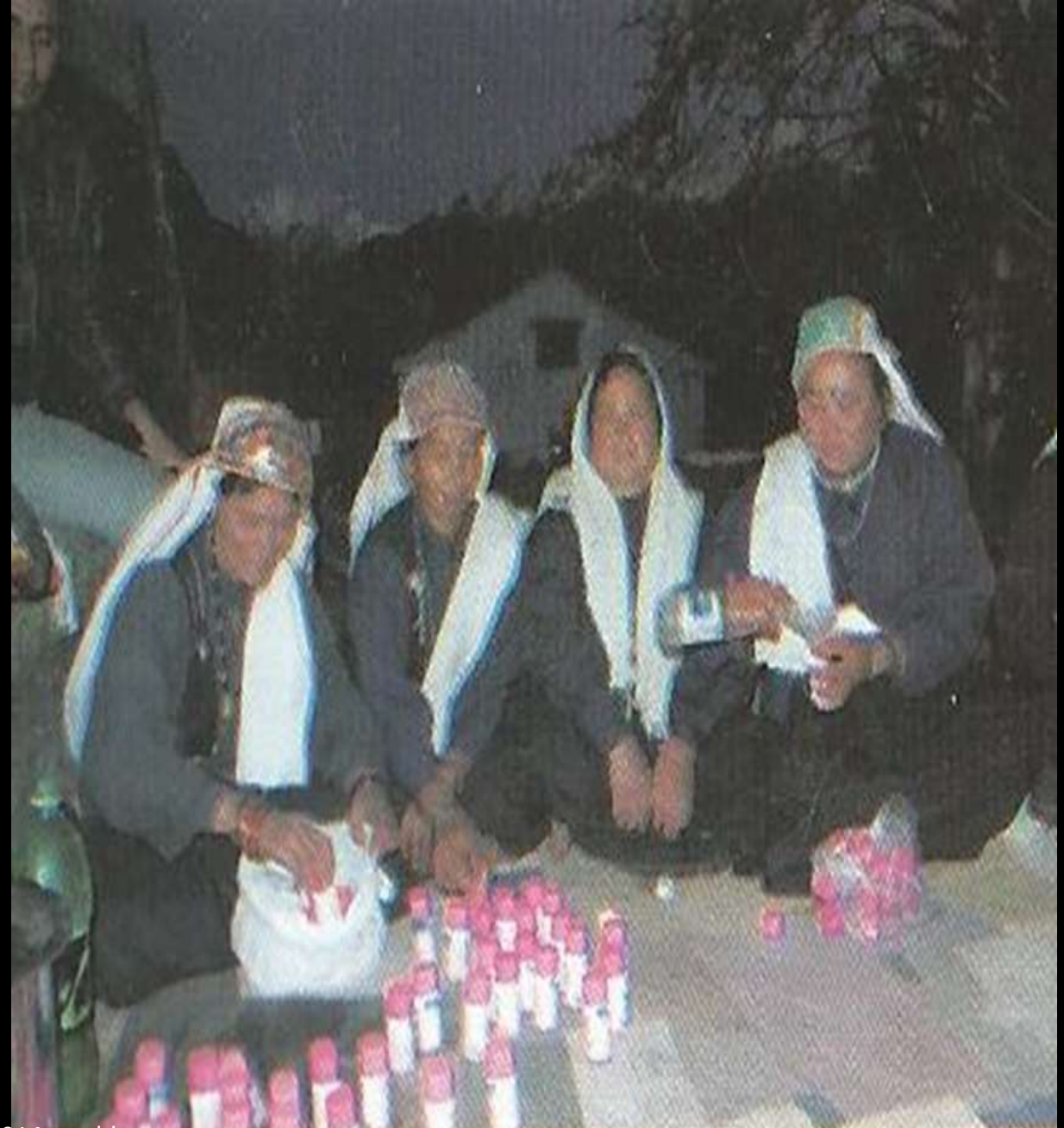
Oil extraction

FILLING OF THE EXTRACTED OIL IN BOTTLES



PACKAGING





STORAGE







Marketing of chamomile plants

www.aniraha13014.weebly.com

S. No.	Cultivated Crops	Minimum Support Price (Rs/ Kg)		
		2009-10	2010-11 to 2011-12	2012-13 to 2014-15
1	Lemongrass Oil	425	550	650
2	Citronella Oil	425	600	700
3	Palmarosa Oil	700	1000	1500
4	Basil Oil	450	700	750
5	Japanese Mint Oil	475	600	750
6	Tagetes Oil	2000	4000	4000
7	Artemisia annua Oil	1200	2000	2000
8	Geranium Oil	4200	6000	6000
9	Costus Oil	35000	50000	50000
10	Caraway Oil	3800	5000	4500
11	Cinnamon Oil	1200	1500	1500
12	Chamomile Oil	25000	36000	38000
13	Chamomile Flowers	125	180	190

S. No.	Himalayan Minor Essential Oils	Minimum Support Price (Rs/ Kg)		
		2009-10	2010-11 to 2011-12	2012-13 to 2014-15
1	Lantana Oil	6600	7000	7000
2	Surai Oil	1600	1800	1800
3	Gania Grass Oil	1200	1250	1250
4	Artemisia maritima Oil	2000	3500	3500
5	Artemisia vulgaris Oil	1900	3500	3500
6	Eupatorium Oil	6000	6000	6000
7	Bhukamber Oil	3800	3800	3800
8	Bhanjira Oil	1800	3000	3000
9	Chenopodium Oil	2000	2500	2500

CENTRE FOR AROMATIC PLANTS (CAP)

Balance Sheet Year 2009-10

S. No.	Particulars	Amount (Rs.)
1.	Recurring Expenditure	12,363,285.00
2.	Capital Expenditure	3,733,625.00
3.	Project Grant Receipts	39,181,000.00
4.	Extra Budgetary Resources (Earning)	864,860.00
	Total	56,142,770.00

Year 2010-11

S. No.	Particulars	Amount (Rs.)
1.	Recurring Expenditure	13,850,281.00
2.	Capital Expenditure	1,427,767.00
3.	Project Grant Receipts	18,100,000.00
4.	Extra Budgetary Resources (Earning)	2,497,421.10
	Total	35,875,469.10

Year 2011-12

S. No.	Particulars	Amount (Rs.)
1.	Recurring Expenditure	15,475,517.00
2.	Capital Expenditure	41,775.00
3.	Project Grant Receipts	15,554,450.00
4.	Extra Budgetary Resources (Earning)	969,815.00
	Total	32,041,557.00

Year 2013-14

S. No.	Particulars	Amount (Rs.)
1.	Recurring Expenditure	21,372,715.00
2.	Capital Expenditure	456,842.00
3.	Project Grant Receipts	23,650,000.00
4.	Extra Budgetary Resources (Earning)	462,712.00
	Total	45,942,269.00

Year 2014-15

S. No.	Particulars	Amount (Rs.)
1.	Recurring Expenditure	18,927,070.00
2.	Capital Expenditure	93,308.00
3.	Project Grant Receipts	19,200,000.00
4.	Extra Budgetary Resources (Earning)	399,126.00
	Total	38,619,504.00

PRODUCTS



Cosmetic Product of *Pelargonium graveolans*:-



Pelargonium graveolans:-

- It is skin care oil which protect from drying and it soothe skin and promoting the formation of red wax.
- It derive from Citrus and Citrus, Citrus, Citrus.
- Country of Origin:- Egypt / South Africa.



Perfect Rouge - Rose 5 Free - Rose Geranium

Adheres elegantly, light and beautiful lips through translucent, dense, cosmetic texture and a glamorous full look.
Produce by - New Zealand

AP/2014

AP/2014 - 2014/2014/2014/2014 (1/1)





Concern

Sugar Free Cookies

Zero Cholesterol
No Trans Fat

Master Carton
hbpl.trustpass.alibaba.com

Display Box, Inner Pack,
Tray and Cookies

* Each Display Box weighs 175 gms.

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43



Rah and Bottles (2+0)

57



76



fewunnecessarystuff.blogspot.com
29/3/2014

A GLIMPSES OF DIFFERENT TYPES OF ESSENTIAL OILS





AROMA GALLERY



CHROMATOGRAPHY

Chromatography:

Chromatography is a method used by scientists for separating organic and inorganic compounds so that they can be analyzed and studied. Chromatography is a great physical method for observing mixtures and solvents.

Chromatography is a process in which we identify organic and inorganic compounds and also identification, purification and separation of these compounds.

Classification of Chromatographic Methods

- ✓ Paper Chromatographic
- ✓ Thin layer Chromatographic (TLC)
- ✓ Gas chromatography
- ✓ High performance liquid chromatography
- ✓ Ion chromatography

WHAT WE HAVE LEARN

- Identification of different aromatic plants.
- General information about different instruments.
- Storage of essential oils.
- Nursery techniques.
- Extraction method of essential oils.

ACHIEVEMENTS AT NATIONAL AND INTERNATIONAL LEVEL

संभवतः, 8 फरवरी 2010

देश की महक लेकर जाएंगे मॉरीशस

अति महत्वपूर्ण व्यक्तियों को उपहार स्वरूप भेंट करेंगे मुख्यमंत्री

प्रमुख समावहता
देहरादून

संभवतः देश की महक लेने में मुख्यमंत्री राजेश प्रोखरियाल निराला की अति महत्वपूर्ण भूमिका होगी। उन्होंने मॉरीशस के अति महत्वपूर्ण व्यक्तियों को उपहार स्वरूप भेंट करने का फैसला किया है।

माटी की खुशबू

- मंगलवार को मंगलपुर में माटी की खुशबू फैलाने का कार्यक्रम आयोजित किया जाएगा।
- विभिन्न विभागों के अधिकारियों को उपहार स्वरूप भेंट करने का कार्यक्रम आयोजित किया जाएगा।

मंगलपुर में माटी की खुशबू फैलाने का कार्यक्रम आयोजित किया जाएगा।

अमर उजाला देहरादून

यूनिवर्सिटी कैम्पस बनाने हैं स्मार्ट

एच.जे.एच.एच.एच. नए कैंपस का शिलान्यास करेंगे मुख्यमंत्री



लोक से ठट्ठक

यूनिवर्सिटी कैम्पस बनाने में स्मार्ट योजना का उपयोग किया जाएगा।

एच.जे.एच.एच.एच. नए कैंपस का शिलान्यास करेंगे मुख्यमंत्री।

ब्यूरोक्रेट से पॉलिटिक्स की पथरीली राह

सहारा देहरादून • शुक्रवार • 17 जनवरी • 2015

पर्वतीय क्षेत्रों में संगंध की खेती बेहतर : पॉल

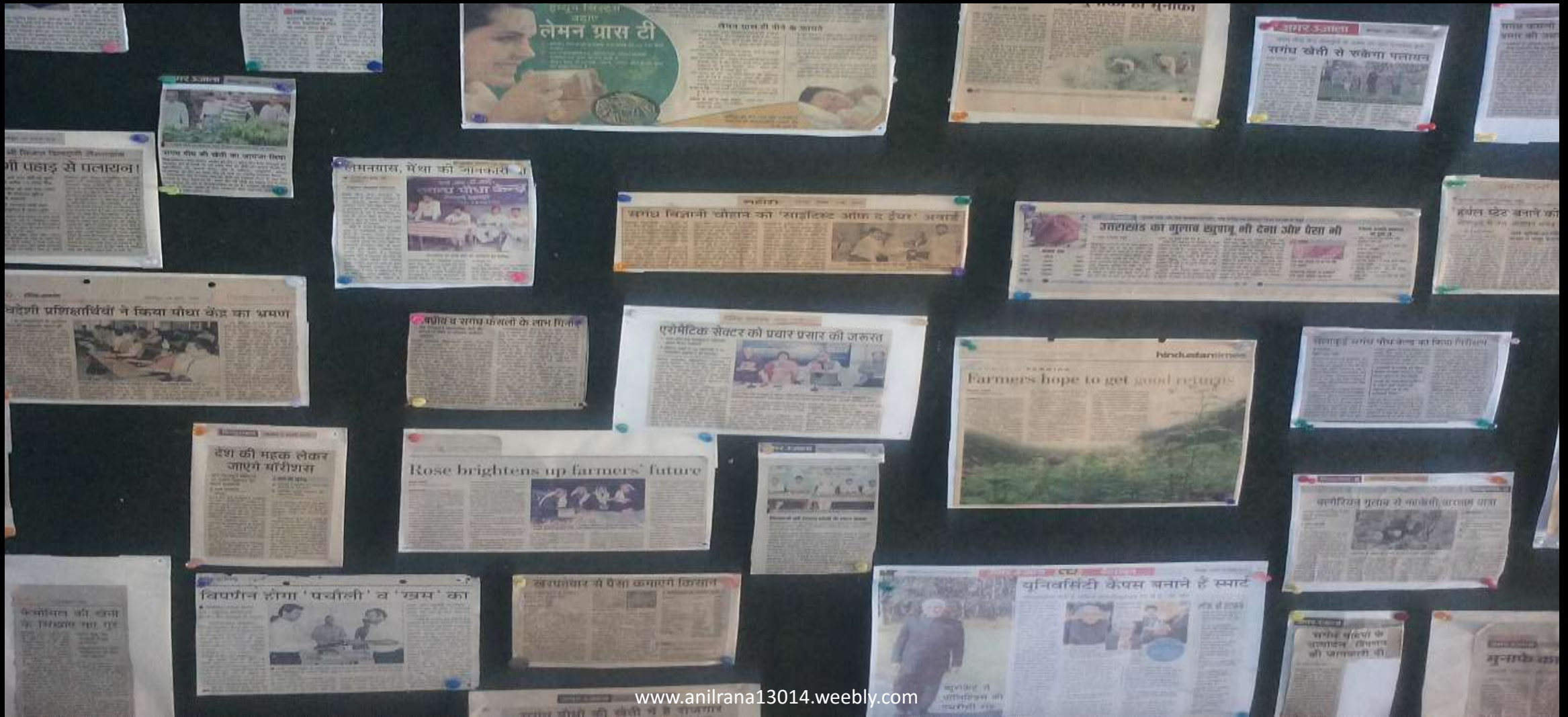


देहरादून (एन.एन.बी.)। राज्यपाल के कृपाश्री पॉल ने पर्वतीय क्षेत्रों में पत्तखाने की खेती के लिए संगंध की खेती को प्रोत्साहित किया है।

राज्यपाल ने कहा कि पर्वतीय क्षेत्रों में पत्तखाने की खेती के लिए संगंध की खेती को प्रोत्साहित किया है।

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हमने मिलकर बड़ा
लेमन ग्रास टी
लेमन ग्रास टी पीने के फायदे
लेमन ग्रास टी पीने के फायदे
लेमन ग्रास टी पीने के फायदे

समृद्ध विज्ञानों चोहान का 'साइडिस्ट अंशक व टीयर' अन्वर्त
समृद्ध विज्ञानों चोहान का 'साइडिस्ट अंशक व टीयर' अन्वर्त

उत्तराखण्ड का गुलाब खुपावू ली देना जीए पैसा ली
उत्तराखण्ड का गुलाब खुपावू ली देना जीए पैसा ली

एरोमेटिक सेक्टर को प्रचार प्रसार की जरूरत
एरोमेटिक सेक्टर को प्रचार प्रसार की जरूरत

Farmers hope to get good returns
Farmers hope to get good returns

Rose brightens up farmers' future
Rose brightens up farmers' future

यूनिवर्सिटी केपस बनाने हैं स्मार्ट
यूनिवर्सिटी केपस बनाने हैं स्मार्ट

पौधे में मिला दिल के लिए फायदेमंद ओमेगा-3 व 6

अरविंद सिंह

वैद्यराजपुरा, उत्तराखण्ड के सेक्टर फॉर एग्रीकल्चरल एंटरप्राइज (कैप) के वैज्ञानिकों ने बाजार में उपलब्ध कॉड लिबर अयल (मछली के तेल) का विकल्प एक पौधे में ढूँढ लिया है। वैज्ञानिकों का दावा है कि 'भंगजीरा' पौधे के बीज और पत्तियों में ओमेगा-3 व ओमेगा-6 प्रचुर मात्रा में पाया जाता है जो कॉड लिबर अयल का बेहतर विकल्प है।



क्या है 'भंगजीरा'
वैज्ञानिकों के मुताबिक भंगजीरा (वैज्ञानिक नाम- पैरिला फ्यूटी-टीम) अम्लीय पर उत्पन्न की एक अल्प उपयोगी फसल है। परिसर में यह सिर्फ किचन गार्डन तक ही सीमित है।

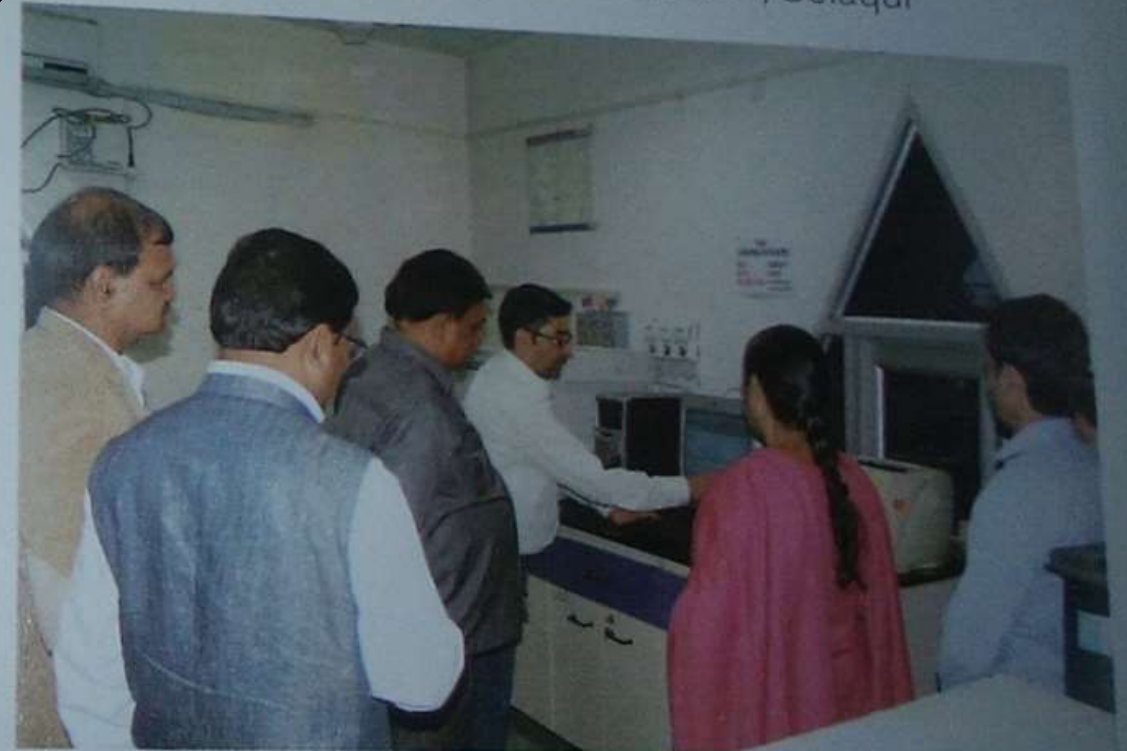
हृदय रोग, उच्च रक्तचाप, कैंसर जैसी बीमारियों में फायदेमंद

कॉड लिबर अयल का उपयोग कोलेस्ट्रॉल, हायब्लिटीज को कम करने के अलावा उच्च रक्तचाप, हृदयरोगी, ऑस्टियोआर्थराइटिस, मनासिक तनाव, स्तुकीमा व ओटिटिस में किचन जैसी बीमारियों के इलाज में होता है। नृत कोशिकाओं को हटाने के साथ-साथ कैंसर एवं एलर्जी में भी यह बेहद लाभकारी है।

भंगजीरा में ओमेगा-3, ओमेगा-6 प्रचुर मात्रा में पाए गए हैं। भंगजीरा का तेल कॉड लिबर अयल का बेहतर विकल्प हो सकता है। जरूरत है कि भंगजीरा का उत्पादन व्यावसायिक स्तर पर किया जाए। सरकार ने कुछ पहल की है जो सकारात्मक कदम है।
- डॉ. नृपेंद्र चौहान (वैज्ञानिक प्रभारी, कैप)

शोध करने वाले वैज्ञानिकों का दावा है कि यदि सरकार व दवा कंपनियों इस दिशा में पहल करें तो 'भंगजीरा' की उत्पादनशक्ति खेती करने वाले किसान के बेहतर आयकर पैदा किए जा सकते हैं। यही नहीं इससे मांस, मछली न खाने वालों को ओमेगा-3 व ओमेगा-6 का शुद्ध और सस्ते में 15 पर

Sign house at CAP, Selauqui



Prof. Matheu Prasad, VC, Horticulture University, Bharsar during his visit at CAP

SUBMISSION OF REPORT

INSTITUTIONAL TRAINING REPORT
ON
CULTIVATION AND PROCESSING OF AROMATIC PLANTS

COLLEGE OF HORTICULTURE
V.C.S.G UTTARAKHAND UNIVERSITY OF HORTICULTURE & FORESTRY
BHARSAR, PAURI GARHWAL, UTTARAKHAND – 246 123



SUBMITTED BY
Anil Rana
(B.Sc. 4th year)

SUBMITTED TO



Centre for Aromatic Plants (CAP)
Industrial Estate, Selaqui-248011

Centre for Aromatic Plant (CAP)
(Government of Uttarakhand)
Industrial Estate Selaqui - 248011, Dehradun , Uttarakhand

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SUBMITTED BY
Rahul Semwal
(B.Sc. 4th year)

SUBMITTED TO



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SUBMITTED BY
Digvijay Singh Chauhan
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SUBMITTED BY
Saurabh Bhatt
(B.Sc. 4th year)

SUBMITTED TO



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Industrial Estate, Selaqui-248011

Centre for Aromatic Plant (CAP)
(Government of Uttarakhand)
Industrial Estate Selaqui - 248011, Dehradun , Uttarakhand



THANK YOU



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