

ANNUAL REPORT

2015-16

**College of Basic Sciences
CSKHPKV, Palampur**

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Foreward

Basic Science is the mother of all inventions. The Basic Sciences are now being given their due importance at ICAR and National level. The faculty of College of Basic Sciences is striving hard to fulfill the mandate through quality education with research and extension support in the University and to generate good human resource to help the rural masses of the State.

The College of Basic Sciences offered 381 credit hours of teaching to the Undergraduates and 200 credit hours to the Postgraduate students of all the constituent colleges of the university during the period of report. Sixty B. Sc., 8 M. Sc. and 4 Ph.D. students completed their degrees during the academic year 2015-2016. Merit scholarships were awarded to 23 students and Amar Shaheed Captain Saurabh Kalia scholarship to 3 students. One educational tour of 2nd year students to North India was successfully conducted. Facilities in the Central Instruments Laboratory were strengthened to impart practical training to the postgraduate students of the constituent colleges and facilitate research. An income of Rs.5,32,451/- was generated by Department of Biology and Environmental Sciences through Vermitechnology revolving fund and Department of Microbiology by imparting paid practical trainings of short durations to the students from other institutions and Department of Physical Sciences and Languages through Statistical Analysis and Audio-Visual Charges.

Teachers of the College were actively involved in various research activities as evident from the projects and number of papers published and presented in National/International Conferences during the year under report. Eighteen research projects funded by different agencies were in operation and six new projects were submitted during the period under report.

Students and staff actively participated in Communal Harmony week celebrations organized in the University Campus. National Science Day was celebrated in the month of February, 2016. The World Environment Day was celebrated on June 7, 2015 in the College. Three INSPIRE Internship Camps, of five days duration each, were organised at CSK HPKV, Palampur

Dr. (Mrs.) Neelam Sharma, Professor & Head, Department of Chemistry & Biochemistry, and Dr. Punam, Principal Scientist (Agroforestry), Department of Biology & Environmental Sciences deserve appreciation for meticulous work of compilation and shaping this report into its final and presentable form.

Palampur

**Dean
College of Basic Sciences**

ANNUAL REPORT

(2015-2016)

COLLEGE OF BASIC SCIENCES

CSK HP KRISHI VISHVAVIDYALAYA

PALAMPUR – 176 062

The College of Basic Sciences is one of the four constituent colleges of the Chaudhary Sarwan Kumar Himachal Pradesh Krishi Vishvavidyalaya, Palampur. Initially conceived as the Department of Basic Sciences and Humanities in the then College of Agriculture in 1978, it was elevated to the rank of College of Basic Sciences in May, 1991. It comprises of four departments, namely Biology and Environmental Sciences, Chemistry and Biochemistry, Physical Sciences and Languages and Microbiology, and a Centre for Geoinformatics Research and Training. The College has the following mandate:

Mandate

- 1.To impart quality education to Under-graduate and Post-graduate students in Basic Sciences leading to B. Sc., M. Sc. and Ph.D. Degrees.
- 2.To provide support in teaching and basic research to other constituent colleges of the university.
- 3.To create trained manpower in different disciplines of Basic Sciences.
- 4.To carry out research work in relation to the state needs for the upliftment of rural masses of the State.

Academics, Students, Staff, Administration & Budget

The faculty of the college was engaged in the following teaching programmes of Under-graduate and Post-graduate studies:

Compulsory courses were offered to the students of (i) B.Sc. (Medical and Non-medical) (ii) B.Sc. (Agri.) (iii) B.Sc. Home Sc. (Hons.) and (iv) B.V.Sc. & A.H. of all the constituent colleges. Postgraduate courses: Major, minor and supporting courses were also offered to the students of M.Sc. and Ph.D. of this college and other constituent colleges. The detail of the total teaching credit hours undertaken by the faculty is given in the Table as below:

Students Intake

Total number of students admitted to various undergraduate and postgraduate programmes during the Academic Session 2015-2016 are as below:

Students Intake during 2015-16			
Programme	Boys	Girls	Total
B. Sc.	35	56	91
M. Sc. (Biochemistry)	01	02	03
M.Sc. (Biology)	Nil	Nil	Nil
M. Sc. (Environment)	Nil	Nil	Nil
M. Sc. (Microbiology)	Nil	Nil	Nil
Ph.D. (Biochemistry)	01	Nil	01
Ph.D. (Microbiology)	Nil	Nil	Nil

Total Student Strength

In total, 254 UG students and 11 PG students registered during the academic year and the break-up is:

Programme	Boys	Girls	Total
B. Sc.	88	166	254
M. Sc. (Biochemistry)	01	02	03
M.Sc. (Biology)	Nil	Nil	Nil
M. Sc. (Environment)	Nil	Nil	Nil
M. Sc. (Microbiology)	Nil	03	03
Ph.D. (Biochemistry)	01	02	03
Ph.D. (Microbiology)	Nil	01	01

At present teachers from other colleges are also associated for teaching in some of the disciplines.

Students Passed Out

The degrees were awarded to 50 UG and 36 PG students as given below

Programme	Boys	Girls	Total
B. Sc.	13	47	60
M. Sc.	04	09	13
Ph.D.	01	02	03

Scholarships Awarded

College Merit Scholarship and *Amar Shaheed Capt. Saurabh Kalia Scholarship* were awarded to the following Undergraduate students:

Merit Scholarship			Amar Shaheed Capt. Saurabh Kalia Scholarship
B. Sc. (I)	B. Sc. (II)	B. Sc. (III)	
Sukant Awasthi	Mayank Mahajan	Shalini Jaryal	Pragati Sharma
Priyanka Sharma	Deeksha	Anjali Bhardwaj	Swapnil
Kiran Verma	Surender Kumar	Aditi Sugha	Manorama
Shivani	Sunidhi	Gurjeet Kaur	
Arun Kumar	Nikita	Shivani Anand	
Kritika	Jayoti Rana	Sunil Rana	
Mridul Sharma	Neha Katoch	Abhilash Chaudhary	
Mamta Sharma	Shivani Devi		
Kanwar Singh			

Budget for Teaching Schemes

The budget expenditure incurred during the year 2015-2016 is given below:

Sr. No.	Scheme No.	Sponsoring Agency	Total Amount (Rs)
College of Basic Sciences			
1.	APL-011-25 (Agri.)(i,ii,iii)	State Govt.	3,48,49,428/-
2.	APL-009-25 (Agri.)	-do-	41,41,306/-
3.	APL-06-25	-do-	5,92,951/-
4.	APL-19-25	-do-	8,88,780/-
		Total	4,04,72,465/-
Budget 2015-2016 Details			
I. Deptt. of Biology and Environmental Sciences			
1.	APL-011-25(iii)	State Govt.	1,41,66,232/-
2.	APL-06-25	-do-	5,92,951/-
		Total	1,47,59,183/-
II. Deptt. of Chemistry & Biochemistry			
1.	APL-011-25(ii)	State Govt.	30,96,701/-
2.	APL-19-25	-do-	8,88,780/-
		Total	39,85,481/-
III. Deptt. of Microbiology			
1.	APL-011-27	State Govt.	23,16,379/-
2.	APL- 009-27	-do-	7,16,106/-
		Total	30,32,485/-
IV. Dean, College of Basic Sciences			
1.	APL-011-25(Agri)(i)	State Govt.	1,52,70,116/-
2.	APL-009-25	-do-	34,25,200/-
		Total	1,86,95,316/-

REPERSENTATION TO VARIOUS UNIVERSITY BODIES FROM COLLEGE

Academic Council

Dr. Kamlesh Singh	Dean
Dr. Anita Singh	Professor & Head, Dept. of Biology & Environmental Sciences till Feb.,2016
Dr. S.S.Kanwar	Professor & Head, Dept. of Microbiology
Dr. RC Chauhan	Professor
Dr. Punam	Principal Scientist (Agroforestry)
Research Council	
Dr. Kamlesh Singh	Dean
Dr.S.S. Kanwar	Professor & Head, Dept. of Microbiology
Dr. K.P. Singh	Professor
Extension Council	
Dr. Kamlesh Singh	Dean
Dr. S.S.Kanwar	Professor & Head , Dept. of Microbiology
Dr. K.P. Singh	Professor

Educational and Resident Instructions Advisory Committee

Dr. Kamlesh Singh	Dean
Dr. S.S.Kanwar	Professor & Head , Dept. of Microbiology
Dr. K.P. Singh	Professor

Constitution of the Board of Studies of College

Dr. Kamlesh Singh	Dean	Chairman
Dr. Manoj Bhargava	HOD, Physical Sciences & Languages	Secretary
Dr. S.S. Kanwar	HOD, Microbiology	Member
Dr. Anita Singh	HOD, Biology and Environmental Sciences	Member
Dr. Neelam Sharma	HOD, Chemistry & Biochemistry	Member
Dr. Sharda Singh	Programme Director, CGRT	Member
Dr. D.C. Sharma	Secretary, Board of Studies, COA	Member
Dr.(Mrs.) Raj Pathania	Secretary, Board of Studies, COHS	Member
Dr. R.Kumar	Secretary, Board of Studies, COVAS	Member

Sports, Games and Literary Activities

The In-charge for various activities were as:

1.	Teacher Incharge (Games & Sports)	Dr. K.P.Singh
2.	Athletic	Dr. Nageswer Singh
3.	Football	Dr. R.C. Chauhan
4.	Basketball	Dr. R.C. Chauhan
5.	Cricket	Sh. Vaibhav Kalia
6.	Volley-ball	Sh. Vaibhav Kalia
7.	Table-Tennis	Dr. Manoj Bhargava
8.	Badminton	Sh. Kapil Sharma
9.	Chess	Dr. Manoj Bhargava
10.	Weight lifting, power lifting and best physique	Dr. K.P.Singh
12.	Cultural Activities	Dr.(Mrs.) Sharda Singh & Dr.(Mrs.) Usha Rana
13.	Literary Activities	Dr.(Mrs.) Anita Singh & Dr.(Mrs.) Suman Sharma
14.	Mountaineering & Hiking	Sh. Kapil Sharma

Educational Tour

An Educational Tour to North India for B.Sc. 2nd Year students of the college was conducted by Dr. R.S. Rana (Tour In-charge), Sh. Kapil Sharma and Dr. (Mrs.) Anita Singh from 20-12-2015 to 28-12-2015.

Department-wise Faculty position

Sr. No.	Name of the Faculty	Designation
DEPARTMENT OF BIOLOGY AND ENVIRONMENTAL SCIENCES		
1.	Dr. (Mrs.) Anita Singh	Professor and Head
2.	Dr. Atul	Professor (Additional charge of Librarian, CSKHPKV)
3.	Dr.K.P.Singh	Professor
4.	Dr. Ramesh C. Chauhan	Professor
5.	Dr. Punam	Principal Scientist (Agroforestry)
5.	Dr.Virendra Singh	Principal Scientist
6.	Dr. Swarn Lata	Principal Scientist (Plant Breeding)
7.	Dr.(Mrs.) Usha Rana	Associate Professor
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY		
1.	Dr. Neelam Sharma	Professor and Head
2.	Dr. Kamal Mohini	Associate Professor
3.	Dr. Suman Sharma	Assistant Professor
4.	Dr. Nageswer Singh	Assistant Scientist (Ad-hoc)
DEPARTMENT OF MICROBIOLOGY		
1.	Dr. S.S.Kanwar	Professor & Head
DEPARTMENT OF PHYSICAL SCIENCES AND LANGUAGES		
1.	Dr Manoj Bhargava	Prof. & Head
2.	Dr Kamlesh Singh	Professor (Additional charge of Dean, COBS & SWO, CSKHPKV,)
3.	Dr.(Mrs.) Sheela Thakur	Assistant Professor (Ad-hoc)
4.	Sh. Kapil Sharma	Computer Teacher
CENTRE FOR GEOINFORMATICS RESEARCH AND TRAINING		
1.	Dr. (Mrs.) Sharda Singh	Professor and Programme Director
2.	Dr. R.S. Rana	Sr. Scientist (Agronomy)
3.	Sh. Vaibhav Kalia	Assistant Professor

Department-wise Staff position in the college

Sr. No.	Name	Designation
DEAN OFFICE		
Ministerial Staff		
1.	Sh. M.R. Chaudhary	Sr. Scale Stenographer
2.	Sh.Kalyan Chand	Supdt. Gr-II Promoted Supdt. w.e.f 12.4.16
3.	Sh. Rajiv Kumar	Sr. Assistant
4.	Sh. Surjeet Kumar	Sr. Assistant
5.	Sh. Vinod Kumar	Clerk
Technical Staff		
1.	Sh. Hukum Singh	STA-II
Class – IV		
1.	Sh. Hari Singh	Peon
2.	Sh. Anup Singh	Beldar
4.	Sh. Sansar Chand	Beldar
5.	Sh. Kehar Singh	Beldar
6.	Smt. Kamlesh Kumari	Sweepress

LAND SCAPPING SECTION (COBS)		
Class-IV		
1.	Sh. Keshav Ram	Beldar
2.	Sh. Kuldeep Kumar	Beldar
BAMBOO SECTION (COBS)		
Technical staff		
1.	-Nil-	
Class-IV		
1.	Sh. Bishamber Dass	Beldar
DEPARTMENT OF BIOLOGY AND ENVIRONMENTAL SCIENCES		
Ministerial Staff		
1.	Sh. Tilak	Jr. Assistant
Technical Staff		
1.	Sh. Vijay Kumar	Technical Assistant Gr. II
2.	Sh. Arjun singh	Transferred to COVAS on 20.7.15
3.	Sh. Baldev Kumar	Transferred to COVAS on 26.5.15
3.	Sh. Kehar Singh	Mali
Class-IV Staff		
1.	Sh. Subhash Chand	Peon
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY		
Ministerial Staff		
-Nil-		
Technical Staff		
1.	Sh. Shakti Chand	Lab. Assistant
Class-IV Staff		
1.	Sh. Manohar Lal	Lab Helper
2.	Sh. Trilok Chand	Lab Helper
DEPARTMENT OF MICROBIOLOGY		
Ministerial Staff		
1.	Sh. Raj Kumar Sharma	Superintendent Gr. II
Technical Staff		
2.	Sh. Jai Raj	Lab Assistant
Class-IV Staff		
1.	Sh. Manohar Lal	Peon
DEPARTMENT OF PHYSICAL SCIENCES AND LANGUAGES		
Ministerial staff		
-Nil-		
Technical Staff		
-Nil-		
Class-IV staff		
1.	Sh. Om Prakash	Peon
CENTRE FOR GEO-INFORMATICS RESEARCH AND TRAINING		
Ministerial staff		
-Nil-		

TEACHING

1. COURSES OFFERED

Following UG and PG courses were offered by the various departments:

I. Department of Biology and Environmental Sciences

Sr. No.	Course No.	Course title	Credit Hours	Name of Instructor/joint instructors
Semester-I				
Undergraduate Courses				
1.	Bot.311	Plant Physiology	2+1	Dr.K.P.Singh
2.	Env 311	Introduction to Environmental Sciences	2+0	Dr. Virendra Singh & Dr. R.C. Chauhan
3.	FST. 247	Environmental Sciences	2+0	Dr. R.C. Chauhan
Postgraduate Courses				
1.	P P 503	Physiological and Molecular Responses of Plants of plants to Abiotic Stresses	2+1	Dr.K.P.Singh
2.	PP 505	Physiology of growth and yield and modelling	2+1	Dr.K.P.Singh
3.	PP 507	Photosynthesis and Respiration	2+1	Dr.K.P.Singh
Semester-II				
Undergraduate Courses				
1.	Cr.Physiol. 241	Crop Physiology	2+1	Dr.K.P.Singh
2.	Bot.221	Morphology and Anatomy of Flowering Plants	2+1	Dr. Punam & Dr. Usha Rana
3.	Bot.321	Genetics	2+1	Dr. Swarn Lata
4.	Bot. 322	Utilization of Plants	2+1	Dr. Anita Singh
5.	PBG 111	Introductory Genetics	2+1	Dr. R.K.Mittal & Dr. Swarn Lata
6.	Env 311	Introduction to Environmental Sciences	2+0	Dr. Virendra Singh
7.	Env 361	Environmental Sciences	1+1	Dr. R.C. Chauhan
8.	Env 321	Introduction to Environmental Sciences	2+0	Dr. R.C. Chauhan
9.	FST 247	Environmental Sciences	2+0	Dr. R.C. Chauhan
Postgraduate Courses				
1.	Bio 506	Plant Physiology	2+1	Dr.K.P.Singh
2.	PP 506	Physiology of Crop Plants- Specific Case Studies	2+0	Dr.K.P.Singh
3.	PP 508	Mineral Nutrition	2+1	Dr.K.P.Singh
4.	GP 503	Principles of Plant Breeding	2+1	Dr. A.S. Gautam & Dr. S.Lata
5.	GP 516	Germplasm collection, exchange & quarantine	2+1	Dr. Satish Paul & Dr. S. Lata
6.	GP 511	Breeding cereals, millets, forages and sugarcane	2+1	Dr. S. Lata & Dr. Neelam Bhardwaj
7.	GP 608	Advances in breeding major field crops	3+0	Dr. S. Lata et al.

II Department of Chemistry and Biochemistry

Sr. No.	Course No.	Course title	Credit Hours	Name of Instructor
Semester-I				
Undergraduate Courses				
1.	Chem-111	States of Matter, Colloids and Chemical Kinetics	3+0	Dr. Suman Sharma
2.	Chem-112	Basic Principles of Inorganic Chemistry, Representative Elements and Noble Gases	3+1	Miss Bhanu Priya
3.	Chem-212	Transition, Inner Transition Elements, Coordination Chemistry and Non Aqueous Solvents	3+0	Mr. Akash Datial
4.	Chem-213	Chemistry of Functional Groups	2+1	Mr. Akash Datial
5.	Chem-311	Solution and Colligative Properties	2+1	Ms. Bhanu Priya
6.	Chem-313	Natural Products, Synthetic Polymers and Dyes	3+0	Mr. Akash Datial
7.	Chem-211	Thermodynamics (old)	2+0	Dr. Suman Sharma
8.	Chem-213	Chemistry of Functional Groups-I(Old)	2+0	Dr. Suman Sharma
9.	Chem-311	Quantum Mechanics & Photochemistry	2+0	Dr. Suman Sharma
10.	Chem-312	Advanced Inorganic Chemistry -I	2+1	Dr. Suman Sharma
11.	Chem-313	Heterocyclics, Pericyclics and Spectroscopy	2+0	Dr. Suman Sharma
12.	Biochem-111	Biochemistry (COHS)	2+1	Dr.Kamal Mohini
13.	FST-351	Biochemistry(COHS)	2+1	Dr.Kamal Mohini
14.	Biochem-351	Biochemistry (COA)	2+1	Dr. Rajan Katoch (Theory) Dr. Nageswer Singh (Pr)
Odd Semester Courses				
15.	Chem-123	Physical Organic Chemistry Hydrocarbons and Organic Halides	3+0	Dr. Suman Sharma
16.	Chem-221	Quantum Mechanics & Photochemistry (New)	3+0	Dr. Neelam Sharma
17.	Chem-222	Advanced Inorganic Chemistry-I (New)	2+1	Dr. Neelam Sharma
18.	Chem-221	Electrochemistry and Phase Equilibrium (Old)	2+0	Dr. Neelam Sharma
19.	Chem-222	Coordination Chemistry and Non Aqueous Solvent (Old)	2+0	Dr. Neelam Sharma
20.	Chem-223	Chemistry of Functional Groups-II (Old)	1+1	Dr. Neelam Sharma
21.	Biochem 212	Biochemistry	2+1	Dr. Nageswer Singh
Postgraduate Courses				
1.	Biochem-501	Basic Biochemistry	3+1	Dr.Kamal Mohini
2.	Biochem-503	Human Biochemistry	3+0	Dr. Nageswer Singh
3.	Biochem-541	Immunochemistry	2+0	Dr. Nageswer Singh
4.	Biochem-551	Techniques in Biochemistry	1+3	Dr. Nageswer Singh
5.	Biochem-591	Seminar	1+0	Dr. Nageswer Singh
6.	Biochem-601	Biochemistry of Biotic and Abiotic Stress	3+0	Dr. Rajan Katoch
7.	Biochem-602	Advanced Molecular Biology	3+0	Dr. M. K.Acharya

8.	Biochem-603	Biomembranes	2+0	Dr. Kamal Mohini
9.	Biochem-604	Advanced Enzymology	2+0	Dr. Nageswer Singh
10.	Biochem-611	Advanced Techniques in Biochemistry	0+2	Dr. Nageswer Singh
11.	Biochem-621	Genomics, Proteomics & Metabolomics	2+0	Dr. M.K. Acharya
12.	Biochem-693	Special Problem in Ph.D.	1+0	Dr. Kamal Mohini
Semester-II				
Undergraduate Courses				
1.	Chem-121	Thermodynamics, Electrochemistry and Equilibrium	3+1	Dr. Suman Sharma (T) Miss. Bhanu Priya (PI)
2.	Chem-123	Physical Organic Chemistry, Hydrocarbons and Organic Halides	3+0	Dr. Suman Sharma
3.	Chem-221	Quantum Mechanics and Photochemistry	3+0	Miss. Bhanu Priya
4.	Chem-222	Advanced Inorganic Chemistry-I	2+1	Ms. Bhanu Priya
5.	Chem-322	Advanced Inorganic Chemistry -II	3+0	Ms. Bhanu Priya
6.	Chem-323	Heterocyclics, Polynuclear Hydrocarbons and Spectroscopy	2+1	Dr. Suman Sharma
7.	Chem-21(Old)	Electrochemistry and Phase Equilibrium	2+0	Dr. Suman Sharma
8.	Chem-22(Old)	Coordination Chemistry and Non-aqueous Solvents	2+0	Dr. Neelam Sharma
9.	Chem-23(Old)	Chemistry of Functional Groups-II	1+1	Dr. Suman Sharma
Odd semester Courses				
10.	Chem-111 (New)	States of Matter, Colloids and Chemical Kinetics	3+0	Dr. Neelam Sharma
11.	Chem-213 (New)	Chemistry of Functional Groups	2+1	Dr. Suman Sharma
12.	Chem-213 (Old)	Chemistry of Functional Groups-I	2+0	Dr. Suman Sharma
13.	Chem-311 (Old)	Quantum Mechanics & Photochemistry	2+0	Dr. Suman Sharma
14.	Chem-313 (Old)	Heterocyclics, Pericyclics and Spectroscopy	2+0	Dr. Suman Sharma
15.	Biochem-351	Biochemistry	2+1	Dr. Rajan Katoch (T) Dr. Nageswer Singh (P)
Postgraduate Courses				
1.	Chem-512	Analytical Chemistry	2+1	Dr. Neelam Sharma
2.	Biochem-502	Plant Biochemistry	3+0	Dr. Kamal Mohini
3.	Biochem-504	Enzymology	2+1	Dr. Nageswer Singh
4.	Biochem-505	Intermediary Metabolism	3+0	Dr. Kamal Mohini
5.	Biochem-521	Food & Nutritional Biochemistry	2+1	Dr. Nageswer Singh
6.	Biochem-591	M.Sc. Seminar	1+0	Dr. Nageswer Singh
7.	Biochem-592	Special Problem in M.Sc.	0+1	Respective Advisor
8.	Biochem-599	Master's Research	1-18	Respective Advisor
9.	Biochem-603	Biomembrane	2+0	Dr. Kamal Mohini
10.	Biochem-604	Advanced Enzymology	2+0	Dr. Nageswer Singh
11.	Biochem-621	Genomics, Proteomics & Metabolomics	2+0	Dr. Rajan Katoch
12.	Biochem-691	Doctoral Seminar	1+0	Dr. Nageswer Singh
13.	Biochem-692	Special Problem in Ph.D.	0+1	Respective Advisor

III Department of Microbiology

Sr. No.	Course No.	Course title	Credit Hours	Name of Instructor
Semester-I				
Undergraduate Courses				
1.	Micro-111 (BOT-111)	Phycology & Microbiology	2+1	Dr.(Ms.) Shivani Chauhan
2.	FST-118	Fundamentals of Microbiology	2+1	Dr.(Ms.) Shivani Chauhan
3.	FST-232	Fermentation and Industrial microbiology	2+1	Dr.(Ms.) Shivani Chauhan
4.	FST-353	Food Biotechnology	2+1	Dr. C.R.Sharma
5.	FST-358	Food Safety and Microbial Standards	2+1	Dr. M.K. Gupta
Postgraduate Courses				
1.	Micro-501	Principles of Microbiology	2+1	Dr. M.K.Gupta
2.	Micro-505	Techniques in Microbiology	0+2	Dr .S.S.Kanwar
3.	Micro-531	Food Microbiology	2+1	Dr.(Ms.) Shivani Chauhan
4.	Micro- 699/700	Doctoral Research		Dr. S.S.Kanwar
Semester-II				
Undergraduate Courses				
1.	Micro-121	Basic Microbiology	1+1	Dr.(Ms.) Shivani Chauhan
2.	Ag. Micro-121	Agricultural Microbiology	2+1	Dr. M.K. Gupta
3.	FST-123	Food Microbiology	2+1	Dr.(Ms.) Shivani Chauhan
Postgraduate Courses				
1.	Micro-501	Principles of Microbiology	2+1	Dr. M.K.Gupta
2.	Micro-531	Food Microbiology	2+1	Dr. C.R.Sharma
3.	Micro-532	Dairy Microbiology	2+1	Dr. M.K.Gupta
4.	Micro-541	Industrial Microbiology	2+1	Dr.(Ms.) Shivani Chauhan
5.	Micro-591/691	Seminar	1+0	Dr. S.S.Kanwar
6.	Micro-699/700	Doctoral Research		Respective Advisor

IV. Department of Physical Sciences and Languages

Sr. No.	Course No.	Course title	Credit Hours	Name of Instructor
Semester-I				
Undergraduate Courses				
1.	Phys.111	Mechanics & Theory of Relativity	4+0	Mrs.Shushila Devi
2.	Phys.112	Current Electricity and Magnetism-I	2+1	Dr (Mrs) Sheela Thakur
3.	Math.111	Algebra and Trigonometry	3+0	Sh V P Sood
4.	Math.112	Calculus	3+0	Dr (Mrs) Sharda Singh
5.	Comp.111	Principles of Computers-I	1+1	Sh Vaibhav Kalia
6.	Eng.111	Communicative and Functional English	2+0	Mrs. Shivani Chauhan
7.	Phys.211	Optics and Lasers	4+0	Mrs.Alpana Thakur
8.	Phys.212	Oscillation and Waves	2+1	Mrs.Sushila Devi
9.	Math.211	Advanced Calculus	3+0	Sh V P Sood
10.	Math 212	Mechanics	4+0	Sh.V D Vasishta
11.	Phys.311	Nuclear Physics	3+0	Mrs.Sushila Devi
12.	Phys.312	Electronics-I	2+1	Mrs.Alpana Thakur
13.	Math.311	Analysis	3+0	Dr (Mrs) Sharda Singh
14.	Math.312	Abstract Algebra	3+0	Sh V D Vasishta
Old Syllabus				
15.	Phys.211	Oscillation and Waves	3+0	Dr (Mrs) Sheela Thakur
16.	Phys.311	Solid State Physics	3+0	Dr (Mrs) Sheela Thakur
17.	Phys.312	Nuclear Physics-I	3+0	Dr (Mrs) Sheela Thakur
18.	Phys.313	Physics Laboratory-V	0+1	Dr (Mrs) Sheela Thakur
19.	Math.312	Abstract Algebra	4+0	Sh V D Vasishta
21.	Stat.351 (COA)	Statistics	1+1	Dr Manoj Bhargava
22.	Eng.111 (COA)	Comprehension and Communication Skills in English	1+1	Mrs. Shivani Chauhan
23.	Comp.111 (COHS)	Computer Science	1+2	Sh Kapil Sharma
24.	Stat.231 (COHS)	Elementary Statistics	1+1	Dr Kamlesh Singh
25.	Comp.115 (COHS)	Application of Computers	2+2	Sh Kapil Sharma
Odd Semester Courses				
27.	Math.121	Ordinary Differential Equations and Vector Analysis	3+0	Dr (Mrs) Sharda Singh
28.	Math.122 (New)	Geometry	3+0	Dr (Mrs) Sharda Singh
29.	Phys.221	Quantum Mechanics and Spectroscopy	3+0	Dr (Mrs) Sheela Thakur
30.	Math.221	Partial Differential Equations	3+0	Dr (Mrs) Sharda Singh
	Math.222 (Old)	Statistics	2+0	Sh.V.P.Sood
31.	Phys.221	Quantum Mechanics and Spectroscopy	3+0	Dr (Mrs) Sheela Thakur
32.	Phys.321	Solid State Physics	3+0	Dr (Mrs) Sheela Thakur
33.	Phys.322 (old)	Electronics	3+0	Dr (Mrs) Sheela Thakur
34.	Introduction to Statistics	Stat.321	2+1	Dr.Manoj Bhargava

Postgraduate Courses				
1.	Stat.491	Introduction to Statistics	1+1	Dr Kamlesh Singh
2.	Stat.511	Statistical Methods for Applied Sciences	3+1	Dr Manoj Bhargava
3.	Stat.513	Sampling Techniques	2+1	Dr Manoj Bhargava
4.	Stat.541	Mathematical Statistics	3+0	Dr Manoj Bhargava
5.	Comp.501	Computer Fundamental and Programming	2+1	Sh Kapil Sharma
Semester-II				
Undergraduate Courses				
1.	Phys.111	Mechanics & Theory of Relativity	4+0	Mrs.Shushila Devi
2.	Phys.112	Current Electricity and Magnetism-I	2+1	Dr (Mrs) Sheela Thakur
3.	Math.111	Algebra and Trigonometry	3+0	Sh V P Sood
4.	Math.112	Calculus	3+0	Dr (Mrs) Sharda Singh
5.	Comp.111	Principles of Computers-I	1+1	Sh Vaibhav Kalia
6.	Eng.111	Communicative and Functional English	2+0	Mrs. Shivani Chauhan
7.	Phys.211	Optics and Lasers	4+0	Mrs.Alpana Thakur
8.	Phys.212	Oscillation and Waves	2+1	Mrs.Sushila Devi
9.	Math.211	Advanced Calculus	3+0	Sh V P Sood
10.	Math.212	Mechanics	4+0	Sh.V D Vasishta
11.	Phys.311	Nuclear Physics	3+0	Mrs.Sushila Devi
12.	Phys.312	Electronics-I	2+1	Mrs.Alpana Thakur
13.	Math.311	Analysis	3+0	Dr (Mrs) Sharda Singh
14.	Math.312	Abstract Algebra	3+0	Sh V D Vasishta
15.	Stat.351 (COA)	Statistics	1+1	Dr Manoj Bhargava
16.	Eng.111 (COA)	Comprehension and Communication Skills in English	1+1	Mrs. Shivani Chauhan
17.	Comp.111 (COHS)	Computer Science	1+2	Sh Kapil Sharma
18.	Stat.231 (COHS)	Elementary Statistics	1+1	Dr Kamlesh Singh
19.	Comp.115 (COHS)	Application of Computers	2+2	Sh Kapil Sharma
20.	Phys.221 (Old)	Optics and Lasers	3+0	Dr (Mrs) Sheela Thakur
21.	Phys.222 (Old)	Atomic, Molecular and X-rays Spectra	2+0	Dr (Mrs) Sheela Thakur
22.	Math.221 (Old)	Differential Equations	4+0	Sh V D Vasishta
Odd semester courses				
23.	Math.111	Algebra and Trigonometry	3+0	Dr.(Mrs)Sharda Singh
24.	Phys.212 (Old)	Quantum Mechanics	3+0	Dr.(Mrs) Sheela Thakur
25.	Math.211 (Old)	Advanced Calculus	4+0	Sh. V.P. Sood
26.	Math.311	Analysis	3+0	Dr.(Mrs)Sharda Singh
Postgraduate Courses				
1.	Stat.511	Statistical Methods for Applied	3+1	Dr Manoj Bhargava

		Sciences		
2.	Stat.513	Sampling Techniques	2+1	Dr Manoj Bhargava
3.	Stat.542	Statistical Inference	2+0	Dr Kamlesh Singh
4.	Comp.501	Computer Fundamental and Programming	2+1	Sh Kapil Sharma

V. Centre for Geoinformatics Research and Training

Sr. No.	Course No.	Course title	Credit Hours	Name of Instructor
Semester-I				
Undergraduate Courses				
1.	GIS-471	Remote Sensing GIS and Land Use planning	1+2	Ranbir Singh Rana/ Vaibhav Kalia
Postgraduate Courses				
1.	GIS-501	Geographic Information System and its Applications	2+1	Ranbir Singh Rana/ Vaibhav Kalia
Semester-II				
2.	GIS-501	Geographic Information System and its Applications	2+1	Ranbir Singh Rana/ Vaibhav Kalia

2. THESES COMPLETED

I. Department of Biology and Environmental Sciences

M. Sc. (Biology)

Sr. No.	Name of student & Admission No.	Title of Thesis	Name of Major Advisor
1.	Priya S-2013-30-005	Physiological and Biochemical characterization of Common Bean for Drought Tolerance	Dr.(Mrs.) Usha Rana
2.	Ranjana Bhardwaj S-2013-30-006	Studies on Morphological and Antioxidant properties of Ocimum sp. in Himachal Pradesh	Dr. Anita Singh

M. Sc. (Environmental Sciences)

Sr. No.	Name of student & Admission No.	Title of Thesis	Name of Major Advisor
1.	Diksha Rana S-2014-30-004	Comparison of soil fertility under seabuckthorn plantation in relation to willow and poplar in Lahaul (HP)	Dr.Virender Singh
2.	Vandana Thakur S-2014-30-005	Survival and growth of seabuckthorn plantations in relation to local environmental conditions in Lahaul (HP)	Dr.Virender Singh
3.	Kalyani Supriya S-2013-30-007	Water Quality in relation to Abundance of Cladocerans in Pond Ecosystem	Dr. R.C. Chauhan
4.	Pooja S-2013-30-008	Seasonal variations in Physico-Chemical Regime of Pond Ecosystem	Dr. R.C. Chauhan

II. Department of Chemistry and Biochemistry

M.Sc. (Biochemistry)

Sr. No.	Name of student & Admission No.	Title of Thesis	Name of Major Advisor
1.	Ankur Tripathi (S-2013-30-001)	Isolation and purification of lectins from <i>vigna</i> species.	Dr. Rajan Katoch
2.	Shipra Singh (S-2013-30-002)	Biochemical Evaluation of Spiked Ginger Lily (<i>Hedychium spicatum</i>)	Dr. Kamal Mohini

Ph. D. (Biochemistry)

Sr. No.	Name of student & Admission No.	Title of Thesis	Name of Major Advisor
1.	Ms. Anita Rana (S-2012-40-001)	Chlorotic Leaf Spot Disease of Arka (<i>Calotropis gigantea</i>): Molecular Characterization of the Causal Agent and Effect on Phytochemical Constituents	Dr. Nageswer Singh
2.	Ms. Nitasha Thakur (S-2012-40-002)	Studies on the effect of metsulfuron methyl on biosynthetic pathway of wheat and its fate in soil.	Dr. Neelam Sharma

III. Department of Microbiology**M. Sc. (Microbiology)**

Sr. No.	Name of the Student and Admission No.	Title of Theses	Name of Major Advisor
1.	Ms. Kavita Rana (S-2013-30-009)	Studies on cellulolytic bacteria from the rumen of migratory goats of Himachal Pradesh.	Dr. Birbal Singh
2.	Ms. Ritu Sharma (S-2013-30-010)	Evaluation of biofilm formation potential of bacterial isolates from hot water spring of Manikaran, Himachal Pradesh.	Dr. S.S. Kanwar
3.	Ms. Shivani Anand Sharma (S-2013-30-011)	Studies on cellulolytic bacteria from the rumen of migratory sheep of Himachal Pradesh.	Dr. Birbal Singh

3. SHORT TRAININGS : Nil

4. MANUAL: Nil

5. NATIONAL ELIGIBILITY TEST (NET)

1.Ms. Reetu (S-2012-40-003)

6. INSPIRE FELLOWSHIP

1.Ms. Vipasha Sharma (S-2014-30-002)

7. ICAR FELLOWSHIP(SRF)

1. Mr. Ankur Tripathi (S-2013-30-001)

RESEARCH**I. ON-GOING RESEARCH PROJECTS :18**

Sr. No.	P.I./Co-P.I.	Title of the Project	Budget outlay (in lakhs)	Funding Agency	Duration of the Project
1.	Dr. Virendra Singh (PI)	Characterization and Consolidation of Hippophae Genetic Resources and Propagation of Elite Genotypes for Varietal Evaluation	34.90	DBT, GOI	2014-17
2.	Dr. Virendra Singh (PI)	Introduction and Evaluation of Improved Russian Seabuckthorn Varieties in Lahaul-Spiti, Cold deserts of Himachal Pradesh	38.0	DST, GOI	2014-17
3.	Dr. Usha Rana (Co-PI)	Standardization and popularization of innovative vegetative propagation technology in potential vegetables under protected conditions.	20.00	MIDH, Deptt. of Horticulture	2016-19
4.	Dr. Punam (PI) Dr. Swarn Lata (Co-PI)	All India Coordinated Research Project on Agroforestry	53.69 Annual	ICAR, CAFRI, Jhansi	Long term
5.	Dr. Punam (Co-PI)	Niche Area of Excellence Programme on "Production and Protection technologies for potential vegetables and pulses under organic farming system"	550.00	ICAR	2012-17
6.	Dr. Punam (Co-PI)	Promotion of Organic Farming through development and popularization of organic input responsive varieties of major pulses of Himachal Pradesh using Participatory Plant Breeding Approach	29.26	RKVY	2016
7.	Dr. Swarn Lata (Co-PI)	Testing of private sector maize hybrids	12.00	Private/Public Sector	2002-till date

8.	Dr.S.S.Kanwar (PI)	Distribution of liquid biofertilizer in Kangra district for cash crops under protected cultivation and development of recommendations based on field experience	25.00	RKVY	2014-16
9.	Dr.S.S.Kanwar (CCPI) Collaborative Project with NDRI, Karnal	Bio prospecting of lactic cultures from cold desert regions to develop functional fermented milk products with potential health benefits	51.89	DST	2015 -18
10.	Dr.S.S.Kanwar (Co-PI) Collaborative project with IVRI, Palampur	Development of Potential direct fed microbial from rumen of migratory goats & sheep for enhancing livestock production	43.50	DST	2012-16
11.	Dr Neelam Sharma (PI)	Pesticides: Usage and residues in vegetable crops of Himachal Pradesh	12.44	UGC	2013-16
12.	Dr. Nageswer Singh (PI)	“Evaluation of nutritionally important biochemical constituents of promising Adzuki bean, Buckwheat and Chenopod genotypes”	0.8	ICAR	Long term
13.	Dr Neelam Sharma (Co-PI)	All India Co-ordinated Research Programme on Weed Control	62.34 Annual	ICAR	Long term
14.	Dr. Sharda Singh, Dr Sanjay Sharma Dr. R.S. Rana, Mr. Vaibhav Kalia	Development of the framework for Networking Programme on Village Information System (VIS) under NRDMS	26.20	NRDMS-DST, New Delhi	2016-2018
15.	Sh. VaibhavKalia Dr. Sharda Singh, Dr. R.S. Rana,	Impact of Geodatabase Model for Assessment And Implementation of Disaster Management Action Plan	2.00	District Administration, Hamirpur	2016-2017
16.	Dr. Sharda Singh, Dr. R.S. Rana, Mr. VaibhavKalia	Establishment of GIS & MIS and Monitoring System –HP Crop Diversification Project, JICA, ODA	49. 60	JICA- HPCDP	2012-2018
17.	Dr. R.S. Rana, Dr. Suresh K Sharma Dr. B.S. Mankotia	Forecasting Agricultural Output using Space, Agro meteorology and Land based observations (FASAL)	Annual grant 4.5 lakh	IMD, New Delhi	2012-2018
18.	Dr. R.S. Rana, Dr. Sharda Singh Mr. Vaibhav Kalia	Climate Change Impact on Productivity of Food grain and Plantation crops” within the umbrella project of “Mountain Ecosystem Processes and Services in North Western Himalaya	40 lakhs	IIRS, Dehradun	2014 – 2018

II. RESEARCH PROJECTS COMPLETED: 2

Sr. No.	P.I./Co-P.I.	Title of the Project	Budget outlay (in lakhs)	Funding Agency
1.	Sh. Vaibhav Kalia Dr. Sharda Singh	Integrated Geo database model for DRDA-Chamba	1.50	DRDA-Chamba
2.	Dr. R.S. Rana Dr. Sharda Singh Dr. Anup Katoch Dr. Rajesh K. Thakur Dr. Anupama Sandal Dr. S. K. Upadhyay Mr. Vaibhav Kalia	Vulnerability Assessment of Agriculture-Horticulture Sector in Kullu District, Himachal Pradesh	12.15	IHCAP, SDC, Delhi

III. RESEARCH PROJECTS SUBMITTED: 6

Sr.No.	Title of the project	Budget outlay	Funding Agency
1.	Multi-centers trial of promising genotypes and capacity building of seabuckthorn (<i>Hippophae</i> L.) to improve livelihood and combat climate change in high altitude Himalayas – Dr. Virender Singh (PI)	498 lakhs	MoEFCC
2.	Conservation and bio-prospection of indigenous yeasts isolated from natural resources for tribal communities of North-Western Himalayas - Dr. S.S.Kanwar (PI)	49.654	NMHS, PMU - GBPIHED
3.	Genetic and Biochemical characterization of Sweet Flag (<i>Acorus calamus</i> L.) ecotypes of North Western Himalayas and popularization for rural upliftment – Dr. Swaran Lata (PI) & Dr. Nageswer (Co-PI)	32.62 lakhs	National Medicinal Plants Board, New Delhi, GOI
4.	Modeling the Agro techniques for Quality and quantity improvement of selected species of herbals in Agro climatic Zone One - Dr. Anita Singh	45 lakh	National Medicinal Plant Board, New Delhi.
5.	Multi-institutional project entitled “Assessing and Predicting Changes In The Western Himalayan Ecosystem Including Tree Line Ecology And Targeted Medicinal Plants Under Climate Change Scenario” – Dr. Sharda Singh as CCPI	Rs 243.16 lakh (Total outlay) Rs. 31.26 lakh (CSKHPKV share)	Ministry of Environment, Forests and Climate Change, GOI under The National Mission on Himalayan Studies (NMHS)
6.	“Fog Harvesting and Dissipation For Crop Water Use In Himachal Pradesh” – Dr. Sharda Singh as Co-PI	Rs.150.00 lakhs	Directorate of Agriculture HP Govt. Shimla

IV. Research Highlights**1. Development of liquid biofertilizer and recommendations based on field experience**

The liquid biofertilizer was prepared in two batches (MBG-15-01 and MBG-16-01). A total of 140L of liquid biofertilizer was prepared and packed in 700 bottles (200 mL each). The developed

liquid biofertilizer had recommended number of microbes (10^8 - 10^9 cfu/ml) upto 180 days at room temperature (15-37°C).



Liquid biofertilizer prepared in the department

The following treatments of liquid biofertilizer were used for field application in cash crops: 200 mL of packed liquid biofertilizer was dissolved in 800 mL of water for further usage.

- Plant seedlings: dipping of seedlings for 30 minutes in liquid biofertilizer
- Seeds: dipping of seeds for 30 minutes in liquid biofertilizer. One bottle of liquid biofertilizer was sufficient for 1 Kg of seeds
- The liquid biofertilizer could further be sprayed on plants for better results.

The biofertilizer was distributed to the identified farmers of district Kangra, Mandi (KVK sundernagar), Kullu (HAREC Bajaura) and Una districts. The liquid biofertilizer was found to be effective on vegetable crops resulting in high yield of cash crops like tomato, capsicum, ginger etc.



A.

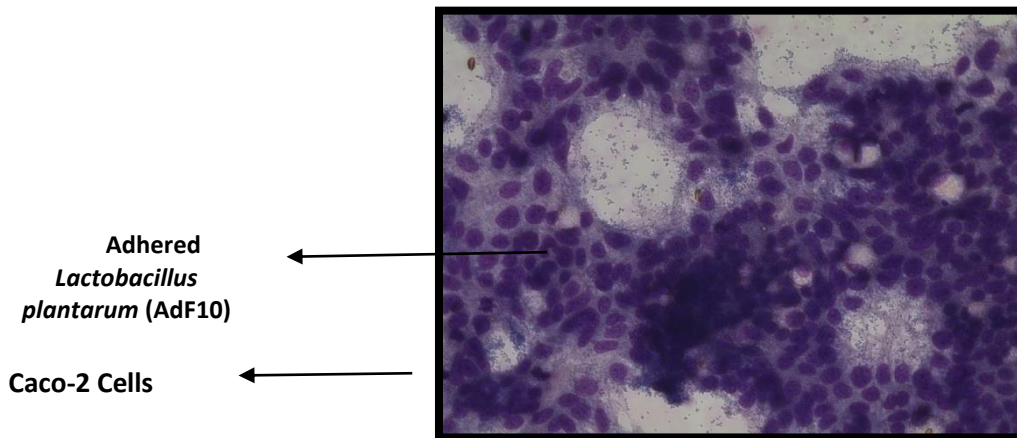


B.

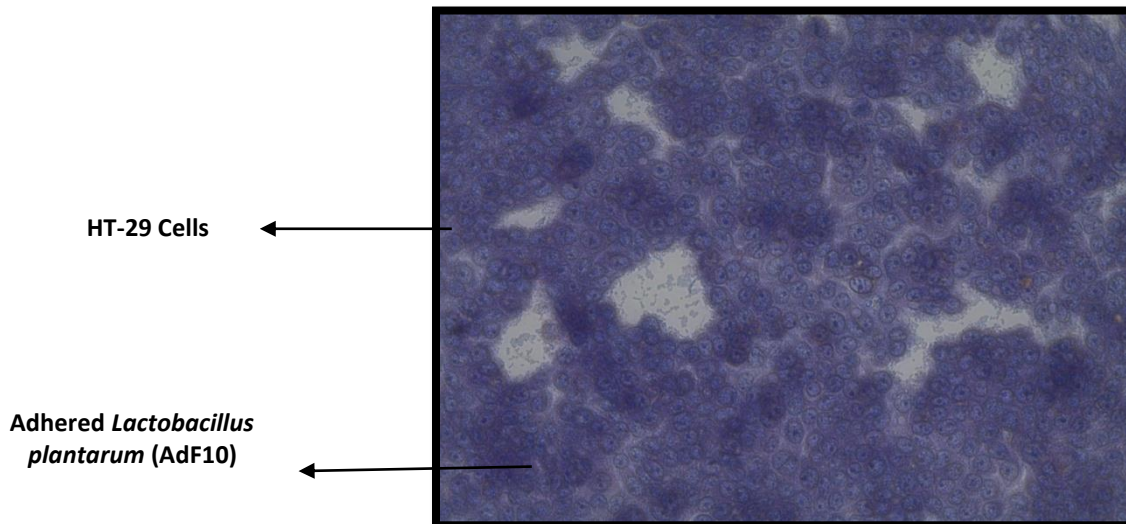
Effect on crop production (A. Tomato B. Capsicum) after treatment with liquid biofertilizer

2. Assessing the adhesion potential of eleven indigenous bacterial probiotics to human colonic epithelial cells

Adherence of bacteria to epithelial cells and mucosal surfaces is a key criterion for selection of effective probiotics. One of the important properties of probiotic bacteria is their ability to adhere to the target sites for their colonization in the gut for expressing optimal functionality. Caco-2 and HT-29 cell lines have been extensively used *in vitro* models of small intestine for probiotic adherence studies to screen effective probiotic strains. Among the eleven tested indigenous isolates, *Lactobacillus plantarum* (AdF10) was the most adhesive strain to HT-29 and Caco-2 cell lines with 10.8 and 9.5% adhesion closely followed by *Lactobacillus plantarum* AdF5 with 9.3 and 8.3% adhesion respectively. Probiotic strains that adhered to Caco2 and HT-29 cell lines were also examined microscopically under inverted microscope.



(A) *In vitro* adherence of probiotic strain *Lactobacillus plantarum* (AdF10) to Caco-2 cell line

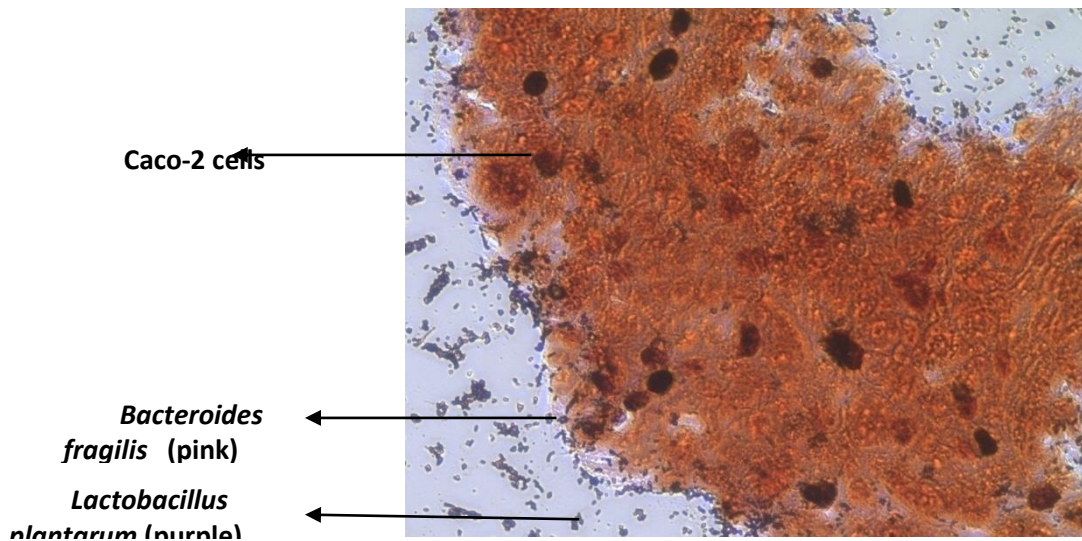


(B) *In vitro* adherence of probiotic strain *Lactobacillus plantarum* (AdF10) to HT-29 cell line

3. Anti-adhesion assays (competition, inhibition and displacement) of anaerobic pathogens in presence of indigenous bacterial probiotics

Antagonistic activity of eleven indigenous probiotic bacteria against clinically significant anaerobic pathogenic bacteria viz., *Clostridium perfringens* (ATCC-13124), *Bacteroides fragilis* (ATCC-25285) and *Peptostreptococcus anaerobius* (ATCC-27337) was evaluated by displacement, competition and exclusion assay. The level of inhibition observed in exclusion assays was higher as

compared to competition and displacement assays. *Lactobacillus plantarum* AdF10 exhibited 84.2 and 83.1% inhibition against *Bacteroides fragilis*, followed by *Peptostreptococcus anaerobius* (84 and 83.9%) and *Clostridium perfringens* (83.4 and 82.7%) respectively on Caco-2 and HT29 cells.



(C) Exclusion assay *Bacteroides fragilis* and *Lactobacillus plantarum* (AdF10) on Caco-2 cells

4. *In Vitro* evaluation of prebiotics for adherence of anaerobic pathogens to Caco2 and HT-29 cell lines

Effect of three commercially available prebiotics viz., lactulose, inulin and fructooligosaccharide was also studied for adherence of pathogenic bacteria viz., *Clostridium perfringens* (ATCC-13124), *Bacteroides fragilis* (ATCC-25285) and *Peptostreptococcus anaerobius* (ATCC-27337) to Caco-2 and HT-29 cell lines. Prebiotic and pathogen interaction resulted in decreased adherence of anaerobic pathogenic bacteria. Fructooligosaccharide exhibited maximum inhibition against *Peptostreptococcus anaerobius* (38%), *Clostridium perfringens* (36%) *Bacteroides fragilis* (18%) followed by inulin with percent inhibition values of *Peptostreptococcus anaerobius* (37%), *Clostridium perfringens* (32%) *Bacteroides fragilis* (16%). Least reduction was found in case of lactulose. Pathogenic bacteria bind to prebiotics instead of epithelial receptor sites, thus blocking the attachment of microorganisms to host cell surfaces.

5. Effects of Probiotic strains on cell proliferation of Caco2 and HT29 cell lines

Caco-2 and HT-29 cell lines, originating from a colon carcinoma, are the widely used *in vitro* cancerous models for the study of intestinal absorption of compounds at the screening level. The aim of this study was to investigate the anti-proliferative effects of cell-free filtrate of eleven indigenous probiotic bacteria on human colorectal adenocarcinoma cell line Caco-2 and HT29 to inhibit the growth of colon cancer cells in a dose-dependent manner as detected by the MTT (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) assay. The inhibition rate on Caco-2 and HT29 was 89.7% and 84.5 % respectively for *Lactobacillus plantarum* (AdF10) followed by *Lactobacillus plantarum* (AdF5 and AdF6), suggesting that these strains could be use as potential probiotics in functional food or in controlling proliferation of cancerous cells.

6. Introduction of 10 Russian seabuckthorn varieties:

Ten nearly thornless and high yielding (8-12 kg fruits/plant) Russian seabuckthorn varieties were introduced under nursery conditions for 2 years at university farm at Kukumseri, Lahaul under DST funded research project on “*Introduction and Evaluation of Improved Russian Seabuckthorn Varieties in Lahaul-Spiti, Cold deserts of Himachal Pradesh*”, for Rs. 38.4 lakh (2014-2017). Up to 2 years of growth under nursery conditions, NX4, NX5 and NX11 Russian seabuckthorn varieties, followed by others have shown high growth and NX6 most poor growth (Fig. 1). Till now, no exotic have shown occurrence of diseases and pests and thorns. 500 saplings of 10 Russian seabuckthorn varieties have been transplanted for field testing (Fig. 2).



Fig. 1. Russian Seabuckthorn varieties in nursery



Fig. 2. Plantation for field testing of exotics.

7. Collection of germplasm of seabuckthorn:

Collected 100 accessions of seabuckthorn from different parts of Lahaul-Spiti under DBT funded research project to develop a germplasm bank and to develop new promising varieties of seabuckthorn (Fig. 3). 4500 saplings of improved cultivar “Drilbu” of seabuckthorn have been propagated for raising mother orchards (Fig. 4).



Fig. 3. 100 accessions of seabuckthorn for rooting. Fig. 4. Improved SBT cultivar “Drilbu”

9. Varieties Identified / Notified:

One single cross maize hybrids viz; EHL161708 was notified at National level for zone -1 of H.P and included in Package and practices of CSKHPKV, Palampur during Agriculture officer's workshop during *Kharif*, 2016.

10. Testing of Private Hybrids – Recommendation

During *kharif*, 2015, twenty nine maize hybrid supplied by various private companies were evaluated along with two checks PMZ-4 (Modified single cross) of Monsanto company and a single cross hybrid, Vivek 21 of VPKAS, Almora at different locations of CSKHPKV viz; Zone- I (CSKHPKV, Akrot and HAREC, Dhaulakuan) and Zone- II (CSKHPKV, Palampur, Sundernagar, Kangra and Bajaura). In summation, in Zone-I of the State, 14 maize hybrids viz, SIRI-5455, DKC 9164, P3377, Polo Gold, DKC 8144, AB 9452, PL 786, P 3441, DKC 8164(IP-8247), DKC 9144, P 3436, Swarna, NK-30 and P 3520 were found suitable for commercial cultivation.

In Zone-II of the State, 24 maize hybrids viz, DKC 9164, DKC 8144, DKC 8164(IP-8247), NMH-803 (Shaurya), KH 5992, P3441, PL 786, AB 9452, Polo Gold, SIRI-5455, Aishwarya 3546, Bio-605, P 3377, Maize 8081, Bio-9544, Bharti 333, NK-30, Bisco Kanak -51, AB 646, DKC 9144, P 3520, P 3436, PG-2442 and Bisco Kohinoor Deluxe were found to be suitable for commercial cultivation in Zone-II of the State.

11. Introduction, evaluation and maintenance of germplasm and development of improved populations:

In order to preserve the available germplasm, fifty local niche based local accessions have been evaluated and characterized for different desirable traits. Some of the locals were selected and involved for the constitution of pools and populations on the basis of different maturity groups.

12. Development of high yielding early / medium duration hybrids suitable for different agro ecological niches.

During *winter* 2015-16, inbreds of promising hybrids were multiplied and maintained for the development of single cross hybrids and inclusion in AICRP trials.

13. In molecular characterization of the causal agent in the plant *Calotropis gigantea*, the presence of virus particle having icosahedral, enveloped entities of approximately 50-60 nm were observed which proved the presence of virus. The sequencing results showed similarity to insect infected virus *Orgyia pseudotsugata* multiple nucleopolyhedrovirus (OpMNV) and virus *Paramecium bursaria chlorella virus* (PBCV). Phytochemical constituents viz. antioxidant activity, quinones, flavonoids, total phenols, ascorbic acid, PPO activity have higher values in infected leaves whereas total chlorophyll and carotenoids had lower values in infected leaves. In case of PPO activity it was found maximum at same time interval for both of the samples. However, PPO activity was found higher in infected sample and lower in healthy sample.

14. Seeds of five *Vigna* species were investigated for hemagglutinating activity against human and rabbit erythrocytes. The seed extracts of *Vigna mungo* and *Vigna radiata* showed agglutination activity with human as well as rabbit erythrocytes, whereas *Vigna unguiculata*, *Vigna umbellata* and *Vigna angularis* exhibited agglutination only with trypsinized rabbit erythrocytes. Among the various tested sugars, agglutination activity was best inhibited by D-galactose. *Vigna radiata* extract exhibited a higher level of agglutination with rabbit erythrocytes and was selected for isolation and purification of lectin. Lectin was purified by employing a protocol that entailed ion exchange, gel filtration and affinity chromatography with 192.47 fold purification and 73.14 (HU/mg) specific activity. Under reducing conditions purified lectin was found to be a monomer with 25.0kDa molecular weight. Maximum agglutination activity of purified lectin was observed at pH 5.0 with (98%) stability and maintained steadily between pH 6-9. Maximum agglutination activity was observed at 37 C (68.76%) and minimum at 65 C

where agglutination activity was completely lost. Agglutination activity was readily inhibited by D-galactose at 3.12mM. Lectins, due to various biological properties have a potential in pest control and plant defense. Their high level expression can confer resistance to a wide range of insects and could be exploited for crop improvement.

15. A significant decrease in biochemical attributes of wheat leaves i.e. acetolactate synthase activity and total soluble protein was observed up to 10 days after metsulfuron methyl application @ 2 g ha⁻¹, 4 g ha⁻¹ and 8 g ha⁻¹. Whereas, amino acid content in wheat leaves was not influenced very distinctly. Over the period of time, total chlorophyll and total sugar content increased significantly in wheat leaves. Quality indices (protein, sugar, amino acid and gluten content) of wheat grain increased significantly with applied metsulfuron methyl treatments. The degradation data indicated that higher dose of metsulfuron methyl i.e. 8 g ha⁻¹ persisted in soil upto 45 days after herbicide application. The degradation of herbicide was rapid and more than 90 per cent of applied metsulfuron methyl in soil dissipated within 15 days of herbicide application. The logarithmic plots of herbicide concentration at different doses versus time fitted first order kinetics decay curves during both years. At the time of harvest, the metsulfuron methyl residues were non-detectable in wheat straw and wheat grain.

16. The rhizome samples of *Hedychium spicatum* commonly known as Kapoor kachari, a medicinal/edible plant were collected from six locations of Himachal Pradesh. Rhizome collections of from Shimla were found to be superior w.r.t. proximate and mineral content whereas Palampur and Baijnath collections were found superior w.r.t. phytochemical constituents.

17. Buckwheat and Chenopod genotypes included in AVT -II of All India Coordinated Research Network on Potential crops superior in individual nutritionally important quality attributes were identified with special reference to high protein and important minerals.

18. In permanent herbicide trial on transplanted rice-wheat sequence, below detectable levels of isoproturon (<0.05 µgg⁻¹), clodinafop (<0.03 µgg⁻¹) and butachlor residues (<0.001µgg⁻¹) were found in post-harvest soil, straw and grain.

19. Soil and rice grain samples from the rice treated fields of farmers of Kangra district at the harvest of the crop recorded below detectable levels (<0.001µgg⁻¹) of butachlor residues.

20. Out of 102 vegetable samples of kullu , 4 showed presence of pesticide residues levels above MRL values.

21. All India Co-ordinated Research Project on Agroforestry:

- Germplasm evaluation studies conducted in the field on *Toona ciliata* and *Sapindus mukorossi* revealed seed source HP5(b) 71 and S3 respectively to be the best performing in terms of various growth parameters.
- In the Soapnut based silvipastoral system, developed for the reclamation of waste lands, *Setaria* grass gave maximum productivity (400q/ha) at a spacing of 50x50 cm.
- Under Horti-medicinal plant based agroforestry system, vermicompost applied @ 5t/ha and supplemented with 4 sprays of vermiwash resulted into maximum yield (145q/ha) of lemon grass which was 101.2% higher than the control.
- Evaluated two varieties K-8 and K-636 of *Leucaena leucocephala* procured from CRIDA, Hyderabad for tree fodder in silvipastoral agroforestry system The laboratory and field germination studies revealed that germination percentage was around 85% for K-8 and 64 % for K-636 variety under lab conditions whereas, it was around 83.5% and 61% respectively under field nursery conditions.
- Studied rooting potential of shoots of different age classes of thornless *Robinia pseudoacacia* L. The study revealed that treatment of growth hormone IBA (500mg/l) was found to be best for initiating

roots in maximum number of cuttings raised from two year old shoots under protected conditions. However, under field conditions NAA (500 mg/l) was found to be giving better results.

22. Development of the framework for Networking Programme on Village Information System (VIS) under NRDMS

<p>STUDY AREAS: Districts Kangra and Una in HP</p>	
<p>Cluster I & Cluster II of Study area in HP</p>	<p>High resolution satellite imagery</p>
<p>Toposheets of area</p>	<p>Cadastral maps of study area</p>
<p>New Methodology of mapping land, water, soil, habitation, assets etc on high resolution satellite imagery being developed in reference to cadastral maps, toposheets</p>	

23. Establishment of GIS& MIS and Monitoring System :

Web GIS Portal for Himachal Pradesh Crop Diversification Project (HPCDP) developed by CGRT, CSKHPKV-Palampur contains spatial and attribute information of the 1st and 2nd priority project sites spread over 5 districts namely Kangra, Mandi, Bilaspur, Una and Hamirpur of Himachal Pradesh. Georeferenced layers namely Project Site boundary, Chak boundary, Khasra boundary, Contours, Source (Nala/River), Check Dam, Power House, Main Channel, Distribution Network, Outlets etc are being generated and uploaded on web portal regularly. The actual implemented datasets for the project sites whose work has been carried out on the ground are now being uploaded on the server. This along with the proposed assets plan can be viewed simultaneously. This provides the user to identify the change in the plan from proposed to actual implemented activity on the project

site. All drawings of the assets to be created and created , action plan maps, salient attributes of project sites, khasra-wise details of project sites along with attribute data of all the layers are also available on the portal for the DPRs being provided by HPCDP, ODA, Hamirpur (HP). All these layers can be interactively explored along with their attribute data on the click of the ‘i’ tool. These layers can be labeled for different parameters like Name, Cost, Ownership etc as the case may be. One of the main feature of the new server technology now provides the user to update the information from field itself. The interoperability and the portability of the data provides a solution to also share the data as service over secured platform. The Helpfile for HPCDP Website Portal provides whole interactive walkthrough the portal.

The web Portal link is <http://14.139.224.135/myapp/vk/cgrtjica.html>



STATE INFO

The page will open with State Info as default page having District Boundaries of Himachal Pradesh and study area of HPCDP



PROJECT SITE INFO

To go to a particular project site, In the NAVIGATION pane, first of all select respective BPMU and then respective Project Site and then proposed/actual sites



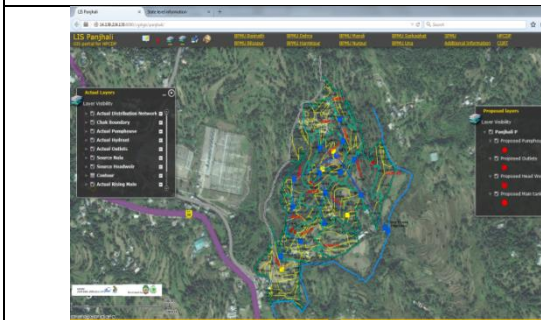
STATE INFO

The page will open with State Info as default page having District Boundaries of Himachal Pradesh and study area of HPCDP

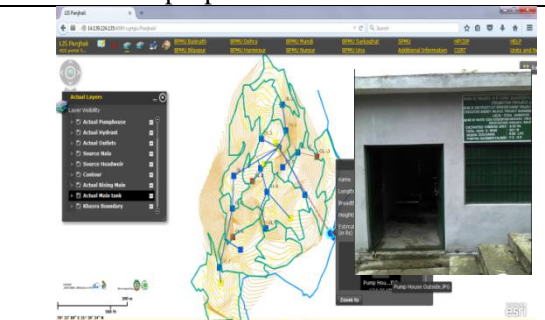


PROJECT SITE INFO

To go to a particular project site, In the NAVIGATION pane, first of all select respective BPMU and then respective Project Site and then proposed/actual sites

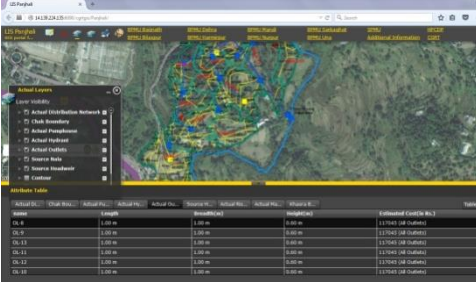
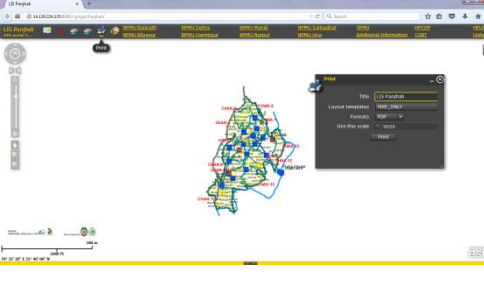


Asset wise Layers: The portal now contains Actual as well as Proposed action plans information on one window. This

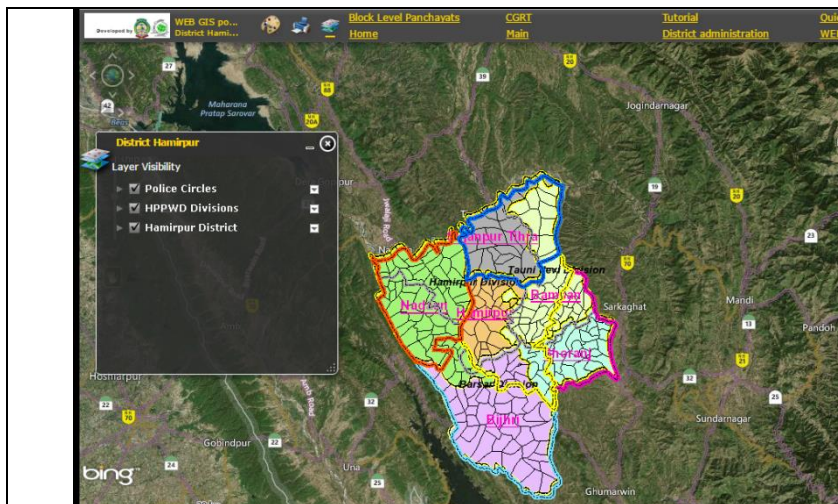


Attribute data:

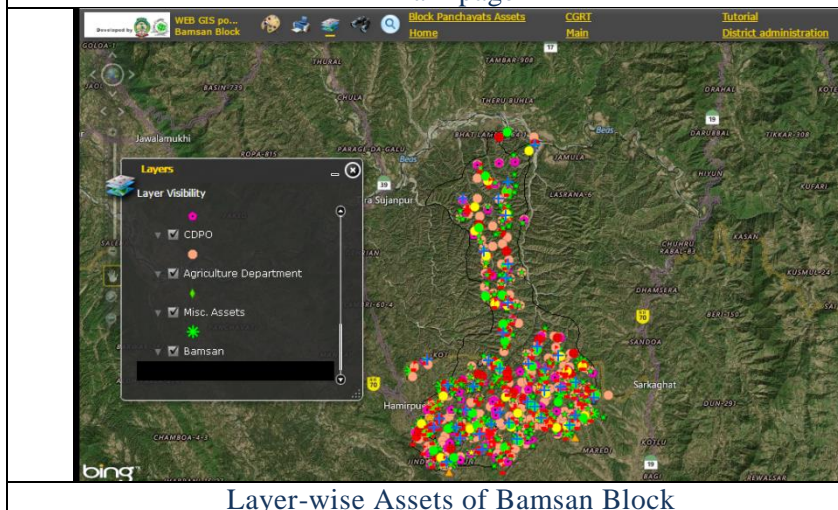
By clicking on the assets the attribute information alongwith the asset geotagged

<p>provides the user to detect for the changes at one place.</p>	<p>image can be viewed easily.</p>
	
<p>Editable data: The attribute information each layer can be securely edited and updated.</p>	<p>On the Fly Print: The user can create custom map that can be printed at client side at any time.</p>

23. Impact of Geodatabase Model for Assessment And Implementation of Disaster Management Action Plan :



Main page



Layer-wise Assets of Bamsan Block

24. Forecasting Agricultural Output Using Agro Meteorology Land Based Observations (FASAL):

MAIZE yield forecast for crop predicted for

Space, and

➤ Crop maize

district Una and Hamirpur using statistical models. Crop yield forecasting carried out for four districts (Hamirpur, Kangra, Chamba and Una districts) for *kharif* season maize crop and *rabi* season wheat crop of Himachal Pradesh. In F2 forecasted yield for Kangra District the predicted value was 1563.4 kg/ha while averaged yield was 1667.4 kg/ha. The RMSE value was 326.7 and R^2 was 0.415. In Chamba District, the predicted value was 3059.9 kg/ha while averaged yield was 2416.20 kg/ha. The RMSE value was 479.3 and R^2 was 0.485. In Hamirpur District, the predicted value was 1657.99 kg/ha while averaged yield was 1772.9 kg/ha. The RMSE value was 284.0 and R^2 was 0.587. In Una District, the predicted value was 2165.94 kg/ha while averaged yield was 2054.8 kg/ha. The RMSE value was 210.9 and R^2 was 0.758.

WHEAT

- In F1 forecasted yield for Kangra District the predicted value was 1759.0 kg/ha while averaged yield was 1580.1 kg/ha. The RMSE value was 61.0 and R^2 was 0.716. In Chamba District, the predicted value was 2008.14 kg/ha while averaged yield was 1620.4 kg/ha. The RMSE value was 214.7 and R^2 was 0.616. In Hamirpur District, the predicted value was 1557.61 kg/ha while averaged yield was 1515.6 kg/ha. The RMSE value was 235.5 and R^2 was 0.409. In Una District, the predicted value was 1966.93 kg/ha while averaged yield was 1774.3 kg/ha. The RMSE value was 338.3 and R^2 was 0.318.
- In F2 forecasted yield for Kangra District the predicted value was 1456.9 kg/ha while averaged yield was 1580.1 kg/ha. The RMSE value was 61.0 and R^2 was 0.590. In Chamba District, the predicted value was 2028.92 kg/ha while averaged yield was 1620.4 kg/ha. The RMSE value was 214.7 and R^2 was 0.619. In Hamirpur District, the predicted value was 1503.45 kg/ha while averaged yield was 1515.6 kg/ha. The RMSE value was 235.5 and R^2 was 0.469. In Una District, the predicted value was 2175.55 kg/ha while averaged yield was 1774.3 kg/ha. The RMSE value was 338.3 and R^2 was 0.506.
- In F3 forecasted yield for Kangra District the predicted value was 1619.54 kg/ha while averaged yield was 1580.1 kg/ha. The RMSE value was 61.0 and R^2 was 0.704. In Chamba District, the predicted value was 2028.31 kg/ha while averaged yield was 1620.4 kg/ha. The RMSE value was 214.7 and R^2 was 0.610. In Hamirpur District, the predicted value was 1732.92 kg/ha while averaged yield was 1515.6 kg/ha. The RMSE value was 235.5 and R^2 was 0.558. In Una District, the predicted value was 2301.97 kg/ha while averaged yield was 1774.3 kg/ha. The RMSE value was 338.3 and R^2 was 0.537.

25. Vulnerability Assessment of Agriculture-Horticulture Sector in Kullu District, Himachal Pradesh :

The climate vulnerability Index for Agriculture for different blocks of Kullu ranged between 0.400 to 0.909 with lowest in Naggar followed by Nirmand and Kullu. The climate vulnerability Index for Horticulture and Livestock for different blocks of Kullu based ranged between 0.214 to 0.934 with Lowest in Naggar followed by Nirmand and Kullu and maximum for Anni and Banjar for horticulture sector. Similarly, Livestock sector VI ranged from 0.017 to 0.879 with minimum in

Naggar followed by Kullu and Nirmand. The net climate vulnerability index in all sectors indicated Naggar block to be least vulnerable followed by Kullu and Nirmand for all sector. Overall VI of Anni was most vulnerable followed by Banjar compared to other blocks. Climate change is described by farmers of Kullu district of Himachal Pradesh as temporal displacement of weather cycles, reflecting changes in crop enterprises and livelihood options. Increasing temperature during summers, prolonged summers, delayed onset and uneven distribution of SW monsoon, delayed onset of winter, short winter periods, temperature above normal during winters, decreasing snowfall during winters, delayed snowfall and shorter winters, low temperature spells at high altitudes during winters and unpredictable rainfalls were the main experiences of the farmers regarding climate change across the blocks. The increasing trends of foggy and cloudy days were reflected significant increase in all blocks.

26. Climate Change Impact on Productivity of Food grain and Plantation crops” within the umbrella project of “Mountain Ecosystem Processes and Services in North Western Himalaya :

The Leaf areas of Maize and Wheat of different sites were collected. The maize crop DSSAT database was generated and Model is being run for Palampur regions and also using gridded data of Rainfall and Temperature. The crop experiment on maize completed and data generated for crop models. The Eddy Covariance Techniques instrument has been obtained and to be installed

27. GRAMIN KRISHI MAUSAM SEWA (Agro meteorological Advisory Service) at Palampur in H.P :

- The five days forecasts on different weather parameters viz. rainfall, temperature, cloud cover, relative humidity and weekly cumulative rainfall for our study districts (Chamba, Kangra, Hamirpur and Una) were validated and weather based agro-advisory prepared
- The total 101 AAS bulletins were prepared in English and Hindi and published in university website (www.hillagric.ac.in /kisano ke leye and www.imdagrimet.gov.in. Kisan Portal (www.farmers.gov.in; www.weathershimla.gov.in and mkisan.gov.in and www.cropweatheroutlook.com of CRIDA (ICAR) websites.
- The advisory sent to service providers IKSL and KCC, 84 SMS to 242093 farmers registered under the Mkisan services of Kangra, Una , Hamirpur and Chamba and total about 22 lakhs farmers received SMS based weather based agro-advisory during 2015-16 under GKMS project
- In the Kisan Portal **84 SMS to 242093** farmers were sent SMS of Agro-advisory since March,2015. So far 242093farmers from four districts (Chamba, Una, Kangra and Hamirpur) have been registered in the portal.
- E-agromet weather based agro advisory are developed for four districts and successfully generated 44 advisories since April, 2016

V. RESEARCH PUBLICATIONS

A. Papers Published

1. Devi B, Singh A and Upadhyay RG. 2015. Morphological variability in Giloya (*Tinosporacordifolia*(Wild) Mires) under Changing Scenario of Climate in North Western Himalayas. *Environment Conversation Journal*. 16(1&2):133-137.
2. Upadhyay RG and Singh A. 2016. Effect of Nitrogen and Zinc on Nodulation, Growth and Yield of Cow pea (*Vigna unguiculata* L.). *Legume Research*. 39(1):149-151.
3. Thakur DR and Singh V. 2016. Economics of production and processing seabuckthorn value based products commercialization of seabuckthorn in cold desert Himalayas. *Indian Journal of Agriculture Business*. 2 (1): 5-20.
4. Patial M, Thakur SR and Singh KP. 2015. Comparative mutagenic effectiveness and efficiency of physical and chemical mutagen and induced variability in ricebean (*Vigna umbellate* Thunb, Ohwi and Ohashi). *Legume Research*. 38(1): 30-36
5. Rana U and kumari M. 2015. Biochemical responses of common bean (*Phaseolus vulgaris* L.) genotypes to water stress under Mid Hill conditions. *Journal of Environment and Bio-Sciences*. 29(2):419-422.
6. Rana U and kumari M. 2016. Effect of drought stress on Biochemical and yield parameters in Common Bean genotypes (*Phaseolus vulgaris* L.). *Indian Journal of Agricultural Biochemistry*. 29 (1): 74-79.
7. Shilpa K, Rameshwar, Saini JP, Punam and Sankhyan NK. 2015. Performance of maize (*Zea mays*) based intercropping systems and their residual effect on wheat (*Triticum aestivum*)+lentil (*Lens culinaris*) intercropping system under organic conditions. *Indian Journal of Agronomy*. 60 (2): 224-229.
8. Kumari R, Punam, Panda AK and Atul. 2015. Agnihotra effect on microbial contamination of air. *The Bioscan*. 10(2):667-669.
9. Sanjay C, Akashdeep S, Rameshwar, Saini JP, Punam, and Singh Y. 2016. Impact of enriched composts and bio-inoculants on yield of garden pea (*Pisum sativum* L.) under organic farming conditions. *Agriculture Research Journal*. 53 (2):273-275.
10. Kumar S, Punam and Kumar R. 2016. Management of fruit fly (*Bactrocera* spp.) in cucumber (*Cucumis sativus*) Linn. Grown organically. *J Biopest*. 9(1): 73-79.
11. Thakur N, Prakash J, Thakur K, Sharma JK, Kumari R, Rana M and S. Lata. 2016. Genetic diversity and structure of maize accessions of North Western Himalayas based on morphological and molecular markers. *Proceeding of National Academy of Sciences, India Section B: Biological Sciences*, India, Sec. B Biol. Sci. ISSN 0369-8211 (DOI: 10.1007/s 40011-016-0716-0).
12. Sood A, Thakur N and S. Lata. 2015. Correlation and path analysis of agro-morphometric traits in maize (*Zea mays* L.) *Himachal Journal of Agricultural Research*. 41(2): 163-167.
13. Sood A, Thakur N and S. Lata. 2016. Study of quality parameters among quality protein (QPM) and normal maize inbreds. *Electronic Journal of Plant Breeding* In press.
14. Prakash J, Thakur N, Rana A, Sood A, Pathania A, Sharma JK and S. Lata. 2016. Genetic variability, inter-relationship and path analysis studies in single cross Quality Protein Maize (*Zea mays* L.) hybrids. *Research in environmental and life sciences*. Manuscript No. : BM- 343. Accepted vide letter no. Ref. No.: RELS/ACC-815/343/2016 Date: 23/6/2016.
15. Bhardwaj A and Chauhan R. 2016. Response of Diatoms to Water Quality in Khajiyar lake, Himachal Pradesh. *International Journal of Ecology, Environment and Conservation*. 22 (2):259-263.
16. Kapoor T; Chauhan R and Chand H. 2015. Impact of Different management Practices on Physico-chemical Properties of soil in Mid Hill, Sub-Humid Zone- II of Himachal Pradesh. *Current World Environment*. 10 (3): 934-940.

17. Kanwar SS and Keshani. 2016. Fermentation of apple juice with a selected yeast strain isolated from fermented foods of Himalayan regions and its organoleptic properties. *Frontiers in Microbiology*. <http://dx.doi.org/10.3389/fmicb.2016.01012>.
18. Kanwar SS, Keshani and Sharma S. 2016. Food additives making life taste better. *Food Marketing and Technology*. 7 (6): 24-26.
19. Devi S and Kanwar SS. 2016. Deciphering the diversity of aerobic culturable thermophiles in hot springs of Manikaran, Himachal Pradesh. *International Journal of Farm Sciences*. 6(1): 156-162.
20. Keshani, Sharma PN, Sharma KD and Kanwar SS. 2015. Molecular and functional diversity of *Saccharomyces cerevisiae* strains of traditional fermented foods of North-Western Himalayas. *Annals of Microbiology*. 65: 2265-2275.
21. Devi S and Kanwar SS. 2015. Evaluation of biotechnological potential of thermo – tolerant bacteria isolated from Manikaran hot spring, Himachal Pradesh. *Journal of Environment and Bio-Sciences*. 29 (2):443-447.
22. Kanwar SS, Walia S, Sharma S. 2015. Impact of probiotics and gut microbiota on host behavior *In* Microbes in Food and Health (Eds.) Neelam Garg, Shadia Mohammad Abdel-Aziz and Abhinav Aeron. *Springer publishers*.
23. Kanwar SS, Sharma S, Walia S, Keshani .2015. Nanoscale materials as novel antimicrobial agents *In* Plant Diseases- Biocontrol Management (Ed.) P.C. Trivedi. *Aavishkar publishers*, pp 205-216 (ISBN 978-81-7910-502-3).
24. Kumari A, Kanwar SS. 2015. Microbiology and biochemistry of indigenous fermented foods *In* Indigenous Fermented Foods of South Asia (Ed.) V.K. Joshi. *CRC press, Taylor & Francis group, London, New York*, pp 107-226 (ISBN 978-1-4398-8790-5)
25. Sourabh A, Kanwar SS. 2015. Health-related issues and indigenous fermented products *In* Indigenous Fermented Foods of South Asia (Ed.) V.K. Joshi. *CRC press, Taylor & Francis group, London, New York*, pp 309-352 (ISBN 978-1-4398-8790-5)
26. Sharma S., Kumari R., Kumar S., Singh N. and Hallan V. 2016. Characterization of cucumber mosaic virus isolates from Valerianajatumansi, a medicinal herb in India.
27. Sharma D, Sharma S, Singh N. and Hallan V. 2015. *Valerianajatumansi* as a new natural host of Bhindi yellow vein mosaic virus and Papaya leaf curl virus Betasatellite from Northern India. *New Disease Reports* 32, 4.
28. Sharma N, Thakur N, Chopra P, Kumar S and Badiyala D. 2015. Evaluation of metsulfuron methyl and clodinafop alone and in combination with other herbicides against weeds in wheat (*Triticumaestivum l.*). *Research on Crops*. 16 (3): 447-455.
29. Kumari S, Sharma N, Joshi R, Gulati A and Sharma P. 2015. Dissipation Studies of Metribuzin in Alfisol soils and its Terminal Residues in Potato tubers. *International Journal of Agriculture, Environment & Biotechnology*. 8(2): 449-455
30. Kumar R, Badiyala D, Sharma N and SK. 2015. Effect of long term application on soil microbial communities in transplanted rice-wheat cropping sequence. *Indian Journal of Weed Science*. 47(1): 71-74.
31. Sharma N, Sharma E, Thakur N, Gulati A, Joshi R and Sharma V. 2016. Persistence of clodinafoppropargyl and its metabolite in soil and wheat crop under North Western Himalayan Region. *Asian journal of Chemistry* 28(7):1493-1497.
32. Thakur N, Sharma N and Joshi R. 2016. Quantitative Determination of Amino Acids by Reversed-Phase High Performance Liquid Chromatography after Pre-column Derivatization. *Asian journal of Chemistry*. 28(9):2017-2019
33. Thakur N, Kumari R, Prakash J, Sharma JK, Singh N and Lata S. 2015. Evaluation of elite maize genotypes (*Zea mays L.*) for nutritional traits. *Electronic Journal of Plant Breeding*, 6(1): 350-354.
34. Kumar P, Pathania NK, Sharma P and Singh N. 2015. Evaluation of lettuce genotypes for yield and quality under protected conditions of Northwestern Himalayas. *Himachal Journal of Agricultural Research*. 41(2): 184-188
35. Sharma N, Angiras NN, Kumar S, Chopra P and Thakur N. 2016. Bioefficacy, phytotoxicity and residues studies of atrazine in maize under North Western Himalayas conditions. *Ecology, Environment and Conservation* (Accepted for Vol 4, 2016)

36. Sharma N, Angiras NN, Kumar S, Chopra P and Thakur N. 2016. Bioefficacy, phytotoxicity and residues studies of atrazine in maize under North Western Himalayas conditions. *Journal of Food, Agriculture and Environment*(Accepted for Vol 3 & 4, April 2016)
37. Janaki P, Sharma N, Chinnusamy C, Sakthive N and Nithya C. 2015. Herbicide residues and their management strategies. *Indian Journal of Weed Science*. 47(3):329–344.
38. Sondhia S, Sharma N, Janaki P and Kaur P. 2015. Herbicide Residue Hazards and their Mitigation. *Indian Farming*. 65(7):34-39.

B. Papers Presented in Conferences and Workshops

1. Kanwar SS, Sharma S and Keshani. 2015. Functional and Protective attributes of bacterial flora of fermented foods of Himachal Pradesh. International Conference in association with Swedish South Asian Network on Fermented Foods (SASNET-FF) on “Ethnic Fermented Foods and Beverages: Microbiology and Health Benefits” held in November 20-21, 2015 at Sikkim University, Gangtok, India. Pp.35.
2. Keshani, Kanwar SS and Chauhan S. 2015. Functional variability and organoleptic studies of Indigenous *Saccharomyces Cervisiae* strains of Himachal Pradesh. International Conference in association with Swedish South Asian Network on Fermented Foods (SASNET-FF) on “Ethnic Fermented Foods and Beverages: Microbiology and Health Benefits” held in November 20-21, 2015 at Sikkim University, Gangtok, India. pp 66.
3. Sharma S, Kanwar SS and Chauhan S. 2015. Growth behavior of Indigenous bacterial probiotics of Himachal Pradesh in presence of different prebiotics. International Conference in association with Swedish South Asian Network on Fermented Foods (SASNET-FF) on “Ethnic Fermented Foods and Beverages: Microbiology and Health Benefits” held in November 20-21, 2015 at Sikkim University, Gangtok, India. pp71.
4. Sharma A, Singh V, Dixit SP and Baghla K. 2015. Role of Seabuckthorn in Improvement of Soil Fertility in Cold Desert of Himalayas. In Proc. of Int. Conf. Seabuckthorn, Nov. 24-26, 2015.
5. Sharma LK, Rana RK, Singh A and Singh V. 2015. Experiences on Mass Multiplication and Systematic Plantation of Seabuckthorn in Cold Desert Condition of Himachal Pradesh. Proc. of Int. Conf. Seabuckthorn, Nov. 24-26, 2015.
6. Rana RK, Singh, Dhaliwal YS and Singh V. 2015. Selection of High Yielding Land Races of Seabuckthorn from Wild Seedling Population of Lahaul and Spiti District of Himachal Pradesh, India. Proc. of Int. Conf. Seabuckthorn, Nov. 24-26, 2015.
7. Bose C, Singh V, Schrenk W and Banerji A. 2015. Molecular Characterizations and Bioactivities of Isolated Seabuckthorn Constituents. Proc. of Int. Conf. Seabuckthorn, Nov. 24-26, 2015.
8. Sharma N, Badiyala D and Thakur N. 2015. Monitoring of herbicide residues in vegetable crops of Himachal Pradesh. Oral presentation in Technical Session -10: “Herbicides persistence and soil health” in 25th Asian-Pacific Weed Science Society Conference on “*Weed Science for Sustainable Agriculture, Environment and Biodiversity*”, Hyderabad on 16 Oct, 2015
9. Rana SS, Badiyala D, Kumar S, Shekhar J, Angiras NN, Sharma N, Kumar R and Pathania P. 2015. Poster presentation – “Long-term effect of continuous use of herbicides on shift in weed flora in rice-wheat sequence”. 25th Asian-Pacific Weed Science Society Conference on “*Weed Science for Sustainable Agriculture, Environment and Biodiversity*”, Hyderabad, India during 13-16 October, 2015, pp 102.
10. Kumar R, Badiyala D, Sharma N, Rana SS and Gautam S. 2015. Poster presentation- “Effect of atrazine and pendimethalin on soil microorganisms in maize-pea cropping system in mid-hill

conditions of Himachal Pradesh". 25th Asian-Pacific Weed Science Society Conference on "*Weed Science for Sustainable Agriculture, Environment and Biodiversity*", Hyderabad, India during 13-16 October, 2015, pp 453.

11. Sood K, Singh S, Singh RR, Rana A, Kalia V and Kaushal A. 2015. Applications of GIS in Precision Farming. In Proceedings of National Seminar on "Precision farming and Technologies for high Himalaya, Edited by MS Kanwar, Vikas Gupta and Liaquat Ali w.e.f. 4-5 October, 2015. pp 8-16, Published by Precision Farming Development Centre, High Mountain Arid Agriculture Research Institute, SKUAST-K, Leh.

C. Technical Reports Submitted

1. Sharma N, Badiyala D, Rana SS and Kumar R. Herbicide residue studies in long term rice-wheat system experiment. pp 1-16.
2. Badiyala D, Rana SS, Sharma N and Kumar R. Major weeds in the noncrop Land of Himachal Pradesh. pp 1-18.
3. Rana SS, Badiyala D, Sharma N and Kumar R. Major weeds in the non-cropped lands of Himachal Pradesh. pp 1-20
4. Badiyala D, Sharma N, Rana SS and Kumar R. Long-term effect of herbicides in rice-wheat cropping system. pp 1-15
5. Punam, S. Lata and Rameshwar. Annual Progress Report (2015-16) of All India Coordinated Research Project on Agroforestry, ICAR. 27p.
6. Singh S, Rana SR, Kalia V: Annual Report for the Project "Establishment of GIS & MIS and Monitoring System –HP Crop Diversification Project, JICA, ODA" Submitted to HPCDP, JICA, ODA, Hamirpur, (2015-2016)
7. Singh S, Sharma S, Kalia V. Quarterly Reports prepared & presented of the Project "Development of the framework for Networking Programme on Village Information System (VIS) under NRDMS" on 16.03.16 at Andhra University Vishakhapatnam & 24.06.2016 at KSCST, Indian Institute of Science Bangalore
8. Singh RR. 2015. Presented the annual report of Forecasting Agricultural Output using space, Agro meteorology and land based observations (FASAL) project in annual review meeting of FASAL Project at University of Agricultural Sciences (UAS) Dharward Karnataka. w.e.f. 23-25 November, 2015
9. Singh RR. 2015. Annual progress report of project entitled "Seventh Annual Review Meeting of Integrated Agromet Advisory Services project held at University of Agricultural Sciences (UAS) Dharward Karnataka, w.e.f. 25-26 (afternoon) November, 2015.
10. Singh RR. 2015-16. Annual progress report of project entitled Vulnerability Assessment of Agriculture-Horticulture Sector in Kullu. District, Himachal Pradesh under Indian Himalayas Climate Change Adaptation Programme (IHCAP) Completed in December, 2015.

D. BOOKS/ BOOK CHAPTERS

i) Book /Booklets:

1. Souvenir and Abstracts Book of 7th Conference of International Seabuckthorn Association on "*Seabuckthorn-Emerging Technologies for Health Protection and Environmental Conservation*", (Eds. Dr. Virendra Singh) November 24-26, 2015, New Delhi, 107p.
2. Proceedings of 7th Conference of International Seabuckthorn Association on "*Seabuckthorn-Emerging Technologies for Health Protection and Environmental Conservation*", (Eds. Dr. Virendra Singh) November 24-26, 2015, New Delhi. 525p.
3. *Himachal Pradesh mein laghu paikshit phaslon ki kheti* (Eds. Neelam Bhardwaj, Punam & JP Saini) Deptt. of Organic Agriculture, CSK HPKV publication 2016. P 37.

ii) Book Chapter/Popular Articles

1. Atul, Rameshwar, Punam & Uppal Rajesh (2016). Morus based silvi-pastoral system in mid-hills of North Western Himalayas. In Technical Bulletin entitled “Agroforestry Technologies for Different Agro-climatic Zones of the Country” ICAR-CAFRI, Jhansi Publication. 16-17 p.
2. Atul, Rameshwar & Punam (2016). Participatory mapping technique to analyze farmers’ perception in adoption of an agroforestry tree. In Technical Bulletin entitled “Agroforestry Technologies for Different Agro-climatic Zones of the Country” ICAR-CAFRI, Jhansi Publication. 18-20 p.
3. Punam (2015). Bio-dynamic Compost & CPP preparation. In: MTC Training Compendium - Organic Agriculture, CSKHPKV Publication. 48-50pp.
4. Punam (2015) NADEP compost preparation. In: MTC Training Compendium - Organic Agriculture, CSKHPKV Publication. 48-50pp.
5. Neelam Bhardwaj, J.P. Saini, Rameshwar, SurinderSharma&S. Lata (2015): Organic production techniques of major *Kharif* crops of Himachal Pradesh in “Organic Farming” 2015. ISBN.978-81-927975-7-1.
6. Ranbir Singh Rana, Sharda Singh, VaibhavKalia, KunalSoodand Aditya (2016) *Jalvayuprabhadhanmein GIS aur remote sensing ki bhumika –ekk parichyay* Kheti(ICAR Hindi monthly magazine) : pp 15-18.

E.COMPENDIUM/Technical Bulletin

1. Punam, Gautam Suresh, Saini J.P. and Atul (2015) Eco-friendly Management Practices -Organic Agriculture, e-compendium, CSKHPKV, Palampur. Under Model Training Course sponsored by Ministry of agriculture, GOI, New Delhi.
2. RanaSurinder Singh, Kumar Rajinder, SharmaNeelam and Badiyala Dinesh. 2015. Effect of continuous use of herbicides on weed shifts in rice-wheat system: Technical Bulletin No-1. Department of Agronomy, College of Agriculture, CSK Himachal Pradesh KrishiVishvavidyalaya, Palampur, HP, India.

F.INFORMATION BROCHURE/ PAMPHLETS PREPARED

1. *Him compost* (In Hindi) (Edited & compiled by Rameshwar, Punam, Saini JP, Munish, Rakesh and Nisha (2015). J.K.P./2/2015
2. *Taral Khadein* (In Hindi) (Edited & compiled by Rameshwar, Punam, Saini JP, Munish and Rakesh (2015). J.K.P./4/2015
3. *Vanaspatik Sutr* (In Hindi) (Edited & compiled by Suriender Sharma, Punam, Rameshwar, Saini JP, Rakesh and Munish(2015). J.K.P./6/2015
4. *Jaivik Sutar* (In Hindi) (Edited & compiled by Surender Sharma, Rameshwar, Punam, Saini JP, Rakesh and Munish (2015). J.K.P./7/2015
5. Handout prepared on Biochemical and medicinal aspects of linseed by Neelam Sharma and Vipasha Sharma

VI. WORKSHOPS/ SEMINARS/ TRAINING PROGRAMMES ATTENDED

- Dr. Virendra Singh attended 7th *Conference of International Seabuckthorn Association* held on Nov. 24-26, 2015 at New Delhi.
- Dr. Punam attended Training on Zero Budget Farming organized by CSKHPKV, Palampur, India: April 27-30, 2016.
- Dr. Punam attended Annual Group Meeting of AICRP on Agroforestry at Srinagar held on July 25-27,2015 and Annual Group Meeting of AICRP on Agroforestry at Solan on June18-20,2016
- Dr. Swarn Lata attended Annual Group Meeting of AICRP on Agroforestry at Solan: June18-20,2016
- Dr. Punam attended Agricultural Officers’ *Rabi* Workshop held on 21-11-15 and Agricultural Officers’ *Kharif* Workshop held on 21-04-16 at CSKHPKV, Palampur

- Dr. Nageswer attended “Krishi Anusndhan avm Takniki Shabdawali” seminar at Indian Grassland and Forage Research Institute, Regional Centre, Palampur on May 19- 20, 2016.
- Dr. Nageswer attended 27th Group Meet of All India Coordinated Research Network on Potential Crops at SDAU, SK Nagar (Gujarat), on May 2 - 3, 2016
- Dr. Neelam Sharma attended 25th Asian-Pacific Weed Science Society Conference on Weed Science for Sustainable Agriculture, Environment and Biodiversity, PJTSAU Hyderabad, India, 13-16 October, 2015
- Dr. Neelam Sharma attended 22nd Annual Review Meet of AICRP-on Weed Management, PJTSAU Hyderabad, India on October 17-18, 2015 and 23rd Annual Review Meeting of AICRP-Weed Management, at Jain Irrigation Pvt Limited Jalgaon, Maharastra, India on April 28-30, 2016.
- Dr. Neelam Sharma attended Agricultural Officers’ *Rabi* Workshop held on 21-11-15 and Agricultural Officers’ *Kharif* Workshop held on 21-04-16 at CSKHPKV, Palampur organized by Directorate of Extension Education,, CSKHPKV, Palampur

EXTENSION

A. Extension projects

Sr. No	Title of the Project	PI or Co-PI	Funding source	Budget (Lakhs)	Duration
1	INSPIRE Internship camp	Coordinator Dr. S.S.Kanwar	DST	Rs. 8.00	15.9.2015 to 19.9.2015
2	INSPIRE Internship camp	-do-	DST	Rs. 8.50	13.10.2015 to 17.10.2015
3	INSPIRE Internship camp	-do-	DST	Rs. 8.50	4.4.2016 to 8.4.2016
4	Bamboo Revolving Fund Scheme	Dr. Anita Singh	Revolving fund		Since April,1994
5	Vermicompost Revolving Fund Scheme	Dr. Anita Singh	Revolving fund		Since April,2000

B. Extension Highlights

1. Dr. Virendra Singh: Developed silvipastoral system of seabuckthorn at KVK, Kukumseri for the training of farmers.
2. Virendra Singh organized a training for 30 farmers on cultivation of seabuckthorn in Lahaul on 20.9.15
3. Dr Punam organized two Interaction meetings with farmers under TSP of AICRP at Village Rajgundha, Chhota Benghal on 21.9.15 and at Village Harer on 28.9.15.
4. Dr Punam organized Model Training course on “Eco-friendly Management Practices – Organic Agriculture” in collaboration with Directorate of Extension Education w.e.f 12.10.2015 to 19.10.2015 at CSK HPKV, Palampur for Agriculture Officers from different states of the country.
5. Dr. Punam organized two one day Agroforestry trainings for 50 farmers each in Village Harer, Distt. Kangra on 16.10.2015 and in village Chhitkul, Distt. Kinnaur on 4.5.2016
6. Dr. Punam and Dr. Swarn Lata developed demonstration trials on farmers’ fields of different agroforestry systems like Silvi-pastoral, agri-pastoral etc. with peoples’ participation in village Balla and village Harer, Distt. Kangra
7. CGRT organized one day workshop (15th December) and one day review meeting (16th December) at Central Potato Research Institute (CPRI), Shimla w.e.f.15-16th December, 2015 under FASAL Project.

C. Lectures delivered by the faculty members

Dr. S.S. Kanwar, Professor and Head

- Delivered a lecture in INSPIRE Internship camp organized by the Dept. of Microbiology, CSKHPKV, Palampur at Palampur from 15th Sept. 2015 to 19th Sept. 2015.

- Delivered a lecture in INSPIRE Internship camp organized by the Dept. of Microbiology, CSKHPKV, Palampur at Palampur from 13th Oct. 2015 to 17th Oct. 2015
- Delivered a lecture in INSPIRE Internship camp organized by the Dept. of Microbiology, CSKHPKV, Palampur at Palampur from 4th April 2016 to 8th April 2016.
- Delivered a lecture in a programme held at Himachal Institute of Pharmaceutical Education and Research, Nadaun, H.P. from 10th Feb. 2016 to 14th Feb. 2016

Dr. Punam

- Delivered lecture under one day Agroforestry Training to Farmers at Village Harer, Distt. Kangra on 16.12.2015.
- Delivered lecture under one day Agroforestry Training to Farmers at Village Chhitkul, Distt. Kinnaur on 4.5.2016
- Delivered lecture under Refresher Course for the Technical and Field assistants of CSKHPKV on 4.7.15
- Delivered Practical lecture to Agriculture Officers on Bio-dynamic compost & CPP preparation under MTC on Organic Agriculture
- Delivered Practical lecture to Agriculture Officers on NADEP preparation under MTC on Organic Agriculture
- Interacted with farmers at Village Rajgundha, Chhota Benghal on 21.9.15.
- Interacted with farmers at Village Harer on 28.9.15.

Dr. Virender Singh

- Delivered lecture on “Seabuckthorn plantation technology” under Training of Eco-Task Force, FRI, Dehradun, 30.01.15.
- Delivered guest faculty lecture on “*Value chain system of seabuckthorn in cold deserts*” in UHF, Nauni on 31.3.16.

Dr. Neelam Sharma

- Delivered a talk on Gender Sensitization in COBS & COHS, CSKHPKV, Palampur on Nov. 23-24, 2015

Dr. Ranbir Rana

- Invited lecture delivered on October 1, 2015 On “Use of crop Weather models and GIS tools for micro-Irrigation scheduling on water shed basis” in short course “Advances in micro irrigation and fertigation Technologies---Efficiency from 1-10 October, 2015 organised by Department of Soil Science
- Extension Lectures: Remote sensing, its concept, need and applications Refresher course for the technical and field assistants of CSKHPKV, Palampur on Agriculture, and animal husbandry w.e.f. 1-15 July 2015 organized by Directorate of extension Education CSKHPKV, Palampur
- Lead lecture entitled “Impact of Climate Change On Animal Production In North Western Himalayan Region” delivered in the Quasquicentennial_Retro Revive, 2014-15 Workshop cum meeting on “Current Status & Future Prospectus Of Animal Production System In Himalayan Region at ICAR-IVRI Regional Station Palampur w.e.f. 13-14 October, 2015.
- Lead Lecture entitled “CLIMATE CHANGE AND PRECISION FARMING IN HIGH HIMALAYAS, 2015” delivered in the National seminar on “Precision farming and Technologies for high Himalaya on 4th October, 2015. At Precision Farming Development Centre, High Mountain Arid Agriculture Research Institute, SKUAST-K, Leh.
- Key lecture on “PRESENT STATUS AND FUTURE PLANS FEEDBACK COLLECTION FROM FARMERS” in Ninth Annual Review meeting of GKMS at UAS Dharward In session V held on 23-

25 November, 2015 (Forenoon) and ARM of FASAL on 25-26 (afternoon) November, 2015 at University of Agricultural Sciences.

D. Other Activities

1. Dr. Anita Singh recorded Radio talk on Medicinal Plants which was broadcasted on 31st March 2016 from Hamirpur Aakashvani.
2. Dr. Punam recorded lecture on Javik Pramanikaran on 9.2.16 in University Audio-video Centre in COHS for preparation of CD on Organic farming for the benefit of the farmers.

MISCELLANEOUS ACTIVITIES

A. INCOME GENERATION

Department	Income Generated
Department of Microbiology	11,975/-
Department of Biology & Environmental Sciences	4,89,976/-
Department of Physical Sciences and Languages	10,500/-
Centre for Geoinformatics Research and Training	20,000/-
Grand Total	5,32,451/-

B. PAPER SETTER/EVALUATOR/EXTERNAL EXAMINER

Sr.No.	Faculty Name	Institution Name
1.	Dr.(Mrs.) Anita Singh	<ul style="list-style-type: none"> • Punjab Agricultural University, Ludhiana • CSA University of Agriculture & Technology, Kanpur • Dr Y S Parmar University of Horticulture and Forestry, Solan • Gautam College, Hamirpur
2.	Dr. R.C. Chauhan	<ul style="list-style-type: none"> • Himachal Pradesh University, Summer Hill, Shimla. • Dr Y S Parmar University of Horticulture and Forestry , Nauni, Solan
4.	Dr. Punam	<ul style="list-style-type: none"> • Shoolini University of Science & Technology, Solan
5.	Dr. Swaran Lata	<ul style="list-style-type: none"> • Banaras Hindu University (BHU).
6	Dr Manoj Bhargava	<ul style="list-style-type: none"> • Dr Y S Parmar University of Horticulture and Forestry , Nauni, Solan
7	Dr. Neelam Sharma	<ul style="list-style-type: none"> • Himachal Pradesh University, Shimla
8	Dr. Kamal Mohini	<ul style="list-style-type: none"> • Dr Y S Parmar University of Horticulture and Forestry , Nauni, Solan
9.	Dr. Nageswer	<ul style="list-style-type: none"> • Punjab Agricultural University, Ludhiana -141004. • Dr Y S Parmar University of Horticulture and Forestry , Nauni, Solan • Abhilashi Institute of Life Sciences, Ner Chouk, Mandi
10	Dr.Ranbir Singh Rana	<ul style="list-style-type: none"> • Agriculture and Soils Department, Indian Institute of Remote Sensing, ISRO, Dept. of Space, Govt. of India Dehradun – 248001,Uttarakhand, India of Andhra University, Visakhapatnam • Division of Agronomy ,Faculty of Post Graduate Studies, Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir, Shalimar • Division of Environmental Sciences, University of Jammu, BABA SAHEB AMBEDKAR Road, Jammu-180006 • Dr. Y S Parmar University of Horticulture and Forestry, Solan (Nauni) HP. • Dr. Y S Parmar University of Horticulture and Forestry, Solan (Nauni) HP.

C. FACULTY AS REFEREE/REVIEWER FOR SCIENTIFIC JOURNALS

i.	Dr. K.P Singh	<ul style="list-style-type: none"> • Associate Editor (2015) in Annals of Plant Physiology, Akola. • National Coordinator and Consulting Editor (2015), Advances in Plant Physiology, Jodhpur.
ii	Dr. Anita Singh	<ul style="list-style-type: none"> • Executive Editor of Journal of Scientific and Applied Research
iii	Dr. Swaran Lata	<ul style="list-style-type: none"> • Reviewer <i>Legume research</i>. An International Journal Vol.39, No.1, 2016 ISSN: 0250-5371.
iv	Dr. S.S. Kanwar	<ul style="list-style-type: none"> • Member, Editorial Board of International Journal of Food & Fermentation Technology. • Member, Editorial Board of Biomedical Research International. • Reviewer Food Research International • Reviewer Journal of Food Science & Technology • Reviewer, African Journal of Biotechnology • Reviewer African journal of Microbiology Research • Reviewer British Microbiology Research Journal
v	Dr. Neelam Sharma	<ul style="list-style-type: none"> • Edited papers of theme 10 & theme 11 of 25th Asian-Pacific Weed Science Society Conference on Weed Science for Sustainable Agriculture, Environment and Biodiversity, PJTSAU Hyderabad, India, held on 13-16 October, 2015
vi	Dr. Sharda Singh	<ul style="list-style-type: none"> • Refree of Journal "<i>Advances in Applied Research</i>"
vii	Dr. Ranbir Singh Rana	<ul style="list-style-type: none"> • Refree of Journal of Agrometeorology • Refree of Himachal Journal of Agri. Research • Refree of Indian Journal of Ecology

D. HONOURS/AWARDS

Dr. Virendra Singh

- **National Award** by Seabuckthorn Association of India for Outstanding Seabuckthorn Research on 24th Nov. 2015 at New Delhi.
- **Appreciation letter** by Hon'ble Vice-Chancellor, CSK HPKV, Palampur for organizing the 7th Conference of International Seabuckthorn Association. November 24-26, 2015, New Delhi
- **Appreciation letter** by President of Seabuckthorn Association of India, for organizing the 7th Conference of International Seabuckthorn Association. November 24-26, 2015, New Delhi.

Dr. Neelam Sharma

- **Appreciation letter** by Hon'ble Vice Chancellor, CSKHPKV for Moderating the first online Viva-voce examination at CSKHPKV, Palampur

E. OTHER ACTIVITIES

Dr. S.S. Kanwar

- Advisor UPSC for selection of Regional Directors

- Member Sectoral Committee of ICAR-National Agricultural Education Accreditation Board on Governance/Personnel/Financial Policies
- Member Peer Review Team of ICAR for accreditation to the University of Agricultural Sciences, Dharward in 2016
- Member of Institute Management Committee of ICAR-Directorate of Mushroom Research, Solan
- Member, Research Council of Dr Y.S.Parmar University of Horticulture and Forestry, Nauni, Solan

Dr Manoj Bhargava

- Nodal Officer (Statistics) of the University
- Nodal Officer (SAS) of the University

Dr. Neelam Sharma

- Rapporteur Technical Session III in 23rd Annual Review Meeting of AICRP-Weed Management, at Jain Irrigation Pvt Limited Jalgaon, Maharashtra, India, 28-30 April 2016.
- Co-convener, Technical Networking Programme of Herbicide Residue Studies of AICRP (WC) at National Level
- Rapporteur Plenary Session 10 & Plenary Session 11 in 25th Asian-Pacific Weed Science Society Conference on Weed Science for Sustainable Agriculture, Environment and Biodiversity, PJTSAU Hyderabad, India, 13-16 October, 2015
- Co-convener, Technical Networking Programme of Herbicide Residue Studies of AICRP (WC) at National Level
- Presiding officer, Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 ,CSKHPKV ,Palampur

Dr. R.C.Chauhan

- Member Expert Committee for Environmental Clearance of the Project Proposals submitted by the Project Proponents to the department of Environment, Science and Technology, Govt. of Himachal Pradesh.
- Member Editorial Board for H.P. Journal of Agricultural Research.

Dr. Punam

- Chairperson, University level Anti-Ragging Women Squad.
- Member of University task force on Crop diversification.
- Organizer university level Van-Mahotsava in August, 2015
- Rapporteur during Annual Group Meet of AICRP on Agroforestry held at Solan w.e.f.June 17-20, 2016.

Dr. Sharda Singh

- Collaborations with IIRS for EDUSAT based trainings in Geoinformatics in the University
- Convener of Inauguration & Valedictory Function in 6th Regional Review meeting (North Zone) of project FASAL at CPRI Shimla on 15-16 December,2015

Dr. Kamal Mohini :

- Internal auditor (for ISO certification)

Dr. Ranbir Singh Rana

- Recognized as resource person and awarded funding for International Workshop w.e.f. 4th -5th January and the five days training on Utilizing Met Data and information .
- Member of experts for Interview conducted by Uttarakhand Public Service Commission (UKPSC), Haridwar
- Member of Interview committee for RA in CSIR-IHBT Projects.
- Appointed as Chief Editor of COBS magazine “Vigyan Punj” Advisor UPSC for selection of Regional Directors
- Member Sectoral Committee of ICAR-National Agricultural Education Accreditation Board on Governance/Personnel/Financial Policies
- Member Peer Review Team of ICAR for accreditation to the University of Agricultural Sciences, Dharward in 2016
- Member of Institute Management Committee of ICAR-Directorate of Mushroom Research, Solan
- Member, Research Council of Dr Y.S.Parmar University of Horticulture and Forestry, Nauni, Solan
- Appointed as Nodal officer of National E-governance Plan –Agricultural-A (NeGP-A)
- Expert for Sustainable Mountain Development SUMMIT-IV w.e.f. 7 to 9th October, 2015 at Itanagar, Arunchal Pradesh under Integrated Mountain Initiative
- Acted as Rapporteur in Session-1 IN GKMS Annual review meeting

Dr Suman Sharma:

- Participated as team manager in XVI All India InterAgricultural Universities Sports And Games Meet 2015-2016 held at Tamil Naidu Agricultural University, Coimbatore from February 22-26, 2016.

Sh. Vaibhav Kalia

- Member of committee to work on issue of iView Server for Cyberoam Log data and upgradation of scanning facility for website publishing
- Member of various committees in 6th Regional Review meeting (North Zone) of project FASAL at CPRI Shimla on 15-16 December,2015

Sh. Kapil Sharma

- Team Manager University Badminton team for North Zone Inter-University Badminton Tournament at Rohtak.
- Managing e-Resources in the University Library.
- Prepared QR codes for the degrees awarded during 13th Convocation of CSKHPKV, Palampur.

Glimpses



Dean IIRS Satya Prakash Kuswaha visited CGRT, COBS on 07.10.15.



IAS Trainees officers visited CGRT on 8.1.16



Visit of Dr. D.S. Rathore, Former Vice-Chancellor, CSKHPKV, Palampur to CGRT, COBS



Mrs. Rupali Thakur, ADC Hamirpur Visit on 18.06.16 for know-how geo-spatial technologies can be used for disaster management



Dr K.K. Katoch, Ex-Vice Chancellor of the University inaugurating one of the INSPIRE Internship Camps.



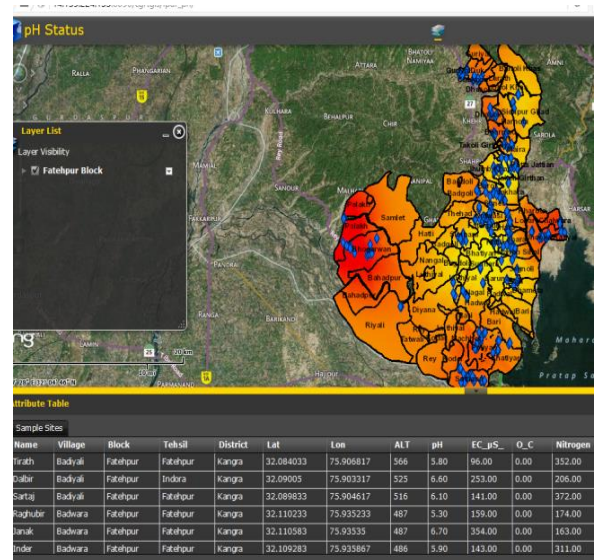
Visit of Students to Model Organic Farm of Deptt. of Organic Agriculture, COA, under INSPIRE programme



Awarding INSPIRE Students



INSPIRE students visit to CGRT



Hon'ble Vice Chancellor's Visit in CGRT on – 12.03.16 for assessing sample of Dynamic Soil Mapping



Dr. R.A. K. Aggarwal, Principal Scientist, National Bureau of Animal Genetic Resources (NBAGR) and Dr. Nageswer Singh, Scientist (Biochemistry) at work in Department of Chemistry and Biochemistry



First Online **viva voce examination at CSKHPKV**

I. WORKSHOPS/ SEMINARS/ TRAINING PROGRAMMES ATTENDED

- **Dr. Punam**
Training on Zero Budget Farming organized by CSKHPKV, Palampur, India: April 27-30, 2016.
Annual Group Meeting of AICRP on Agroforestry at Srinagar held on July 25-27, 2015 and Annual Group Meeting of AICRP on Agroforestry at Solan on June 18-20, 2016
- **Dr. Nageswer**
“Krishi Anusndhanavm Takniki Shabdawali” seminar at Indian Grassland and Forage Research Institute, Regional Centre, Palampur on May 19- 20, 2016.
27th Group Meet of All India Coordinated Research Network on Potential Crops at SDAU, SK Nagar (Gujarat), on May 2 - 3, 2016.
- **Dr. Neelam Sharma**
25th Asian-Pacific Weed Science Society Conference on Weed Science for Sustainable Agriculture, Environment and Biodiversity, PJTSAU Hyderabad, India, 13-16 October, 2015
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Agricultural Officers’ *Rabi* Workshop held on 21-11-15 and Agricultural Officers’ *Kharif* Workshop held on 21-04-16 at CSKHPKV, Palampur organized by Directorate of Extension Education, CSKHPKV, Palampur.
- **Dr. SwarnLata**
Annual Group Meeting of AICRP on Agroforestry at Solan: June 18-20, 2016
- **Dr. Virendra Singh**
7th Conference of International Seabuckthorn Association held on Nov. 24-26, 2015 at New Delhi.