

### LIST OF UNDER GRADUATE STUDENTS SECURED DISTINCTION

#### BIHAR AGRICULTURAL COLLEGE, SABOUR, BHAGALPUR

S.No	Name of the students	Roll No.	Registration No.	OGPA	Degree	Male/ Female
1.	Abhishek prasad	BAC/08/2012-13	A/BAC/356/2012-13	8.032	B.Sc. (Ag.)	Male
2.	Kajal Kiran	BAC/41/2012-13	A/BAC/378/2012-13	8.036	B.Sc. (Ag.)	Female
3.	Shaheena Parveen	BAC/07/2012-13	A/BAC/355/2012-13	8.039	B.Sc. (Ag.)	Female
4.	Neha Kumari	BAC/11/2012-13	A/BAC/358/2012-13	8.049	B.Sc. (Ag.)	Female
5.	Sneha Shikha	BAC/10/2012-13	A/BAC/389/2012-13	8.092	B.Sc. (Ag.)	Female
6.	Nitu Kumari	BAC/29/2012-13	A/BAC/369/2012-13	8.113	B.Sc. (Ag.)	Female
7.	Shriti Moses	BAC/36/2012-13	A/BAC/375/2012-13	8.137	B.Sc. (Ag.)	Female
8.	Mamta	BAC/34/2012-13	A/BAC/373/2012-13	8.155	B.Sc. (Ag.)	Female
9.	Sweta Kumari	BAC/39/2012-13	A/BAC/377/2012-13	8.180	B.Sc. (Ag.)	Female
10.	Mina Kumari	BAC/03/2012-13	A/BAC/352/2012-13	8.239	B.Sc. (Ag.)	Female
11.	Neha Abhilasha	BAC/31/2012-13	A/BAC/371/2012-13	8.364	B.Sc. (Ag.)	Female
12.	Ummay Hafsa	BAC/56/2012-13	A/BAC/387/2012-13	8.417	B.Sc. (Ag.)	Female
13.	Smriti Sanjayam	BAC/24/2012-13	A/BAC/367/2012-13	8.464	B.Sc. (Ag.)	Female
14.	Anshu	BAC/14/2012-13	A/BAC/361/2012-13	8.827	B.Sc. (Ag.)	Female
15.	Surya Hembrom	BAC/04/2012-13	A/BAC/353/2012-13	8.866	B.Sc. (Ag.)	Female
16.	Anjali Kumari	BAC/02/2012-13	A/BAC/351/2012-13	8.983	B.Sc. (Ag.)	Female

#### BHOLA PASWAN SHASTRI AGRICULTURAL COLLEGE, PURNEA

17.	MD.Mahtab Rashid	BPSAC/21/2012-13	A/BPSAC/501/2012-13	8.587	B.Sc. (Ag.)	Male
18.	Anwasha Dey	BPSAC/01/2012-13	A/BPSAC/429/2012-13	8.346	B.Sc. (Ag.)	Female

**Student's Profile****3<sup>rd</sup> Convocation-2017**

19.	Pooja Rani	BPSAC/25/2012-13	A/BPSAC/446/2012-13	8.318	B.Sc. (Ag.)	Female
20.	Purnima Singh	BPSAC/03/2011-12	A/BPSAC/431/2012-13	8.248	B.Sc. (Ag.)	Female
21.	Surabhi Sinha	BPSAC/31/2012-13	A/BPSAC/450/2012-13	8.199	B.Sc. (Ag.)	Female
22.	Soni Kumari	BPSAC/38/2012-13	A/BPSAC/455/2012-13	8.013	B.Sc. (Ag.)	Female

**MANDAN BHARTI AGRICULTURAL COLLEGE, AGWANPUR, SHARSHA**

23	Pankaj Pumar	MBAC/02/2012-13	A/MBAC/409/2012-13	8.351	B.Sc. (Ag.)	Male
24.	Nudrat Sanzida Akhtar	MBAC/08/2012-13	A/MBAC/412/2012-13	8.006	B.Sc. (Ag.)	Female
25.	Avinash Kumar	MBAC/09/2012-13	A/MBAC/413/2012-13	8.051	B.Sc. (Ag.)	Male
26.	Sweeti Kumari	MBAC/10/2012-13	A/MBAC/414/2012-13	8.046	B.Sc. (Ag.)	Female
27.	Avinash Kumar	MBAC/09/2012-13	A/MBAC/413/2012-13	8.051	B.Sc. (Ag.)	Male
28.	Anand Kumar	MBAC/13/2012-13	A/MBAC/416/2012-13	8.248	B.Sc. (Ag.)	Male
29.	Rahul Kumar	MBAC/14/2012-13	A/MBAC/417/2012-13	8.324	B.Sc. (Ag.)	Male
30.	Abhishek Raj	MBAC/15/2012-13	A/MBAC/418/2012-13	8.096	B.Sc. (Ag.)	Male
31.	Awdhesh Kumar	MBAC/19/2012-13	A/MBAC/420/2012-13	8.099	B.Sc. (Ag.)	Male

**VEER KUWAR SINGH COLLEGE OF AGRICULTURE, DUMRAON**

28.	Rakesh Kr. Rajak	VKSCOA/06/2012-13	A/COA/464/2012-13	8.058	B.Sc. (Ag.)	Male
29.	Rani Kumari	VKSCOA/07/2012-13	A/COA/465/2012-13	8.332	B.Sc. (Ag.)	Female
30.	Abha Sinha	VKSCOA/10/2012-13	A/COA/468/2012-13	8.049	B.Sc. (Ag.)	Female
31.	Garima Singh	VKSCOA/15/2012-13	A/COA/473/2012-13	8.331	B.Sc. (Ag.)	Female
32.	Ashwini Kumar	VKSCOA/17/2012-13	A/COA/475/2012-13	8.085	B.Sc. (Ag.)	Male

**SANJAY GANDHI INSTITUTE OF DAIRY TECHNOLOGY, PATNA**

33.	Manorama Kumari	SDT/09/2012-13	DT/SGIDT/347/2012-13	8.136	B.Sc. in Dairy Tech.	Female
-----	-----------------	----------------	----------------------	-------	----------------------	--------

**LIST OF POST GRADUATE STUDENTS SECURED DISTINCTION****Bihar Agricultural College, Sabour, Bhagalpur**

S.No	Name of the students	Registration No.	Major Subject	OGPA	Degree	Male/ Female
01	Vikas Kumar Patel	M/Ento./186/BAC/2014-15	Entomology	8.824	M.Sc. (Ag.)	Male
02	Meenakshi Kumari	M/Hort./154/BAC/2014-15	Horticulture	8.762	M.Sc. (Ag.)	Female
03	Kumari Neha	M/PBG/204/BAC/2014-15	Plant Breeding & Genetics	8.723	M.Sc. (Ag.)	Female
04	Syed Razaul Islam	M/Hort./170/BAC/2014-15	Horticulture	8.603	M.Sc. (Ag.)	Male
05	Nisha Rani	M/Hort./159/BAC/2014-15	Horticulture	8.546	M.Sc. (Ag.)	Female

**BIHAR VETERINARY COLLEGE, PATNA**

06	Subhash Kumar	M/ARGO/217/BVC/2014-15	Veterinary Gynaecology and Obstetrics	8.757	M.V.Sc.	Male
07	Vinita Yashveer	M/AGB/136/BVC/2013-14	Animal Genetics & Breeding	8.689	M.V.Sc.	Female
08	Bhawesh Kumar	M/ARGO/218/BVC/2014-15	Veterinary Gynaecology and Obstetrics	8.625	M.V.Sc.	Male
09	Alok Kumar	M/VPH/227/BVC/2014-15	Veterinary Public Health	8.524	M.V.Sc.	Male

## LIST OF DEGREE RECIPIENTS OF UNDER GRADUATE PROGRAMME

## BIHAR AGRICULTURAL COLEGE, SABOUR, BHAGALPUR

01	Name of student	: Anjali Kumar	Degree	: B.Sc. in Agriculture
	Father's name	: Sri Shyam Nandan Singh	OGPA	: 8.983
	Address	: North Of Kutiya , Shyam Nagar, Jehanabad , Bihar	College Name	: BAC, Sabour
	Date of Birth	: 02/01/1995	Mobile NO.	: 9097183778
	Category	: OBC	Email Id	: anjalikumari.sn@gmail.com
	Roll No.	: BAC/02/2012-13	Present Status	: Admitted in Post Graduate Programme at BAC, Sabour
02	Name of student	: Mina Kumari	Degree	: B.Sc. in Agriculture
	Father's name	: Sri Amrindra Kumar Yadav	OGPA	: 8.239
	Address	: Jaipalpatti Ward No- 15, District : Madhepura, 852113, Bihar	College Name	: BAC, Sabour
	Date of Birth	: 05/02/1992	Mobile NO.	: 9709222269
	Category	: OBC	Email Id	: minayadav5292@gmail.com
	Roll No.	: BAC/03/2012-13	Present Status	: Admitted in Post Graduate Programme at BHU, Baranasi
03	Name of student	: Surya Hembrom	Degree	: B.Sc. in Agriculture
	Father's name	: Late Bagun Hembrom	OGPA	: 8.866
	Address	: C/O-Arjun Purty, Road No.- 15 ,Adityapur Colony District Seraikela, Kharsawan, 831013, Jharkhand	College Name	: BAC, Sabour
	Date of Birth	: 02/09/1993	Mobile NO.	: 8809853658
	Category	: ST	Email Id	: rmonu9@gmail.com
	Roll No.	: BAC/04/2012-13	Present Status	: -
04	Name of student	: Sunil Kumar Mandal	Degree	: B.Sc. in Agriculture
	Father's name	: Late Ganesh Mandal	OGPA	: 7.777
	Address	: Vill. Raghapur ,Po.-haridaspur, Ps. Nathnagar, dist. Bhagalpur, 812006, state- Bihar	College Name	: BAC, Sabour
	Date of Birth	: 24/12/1983	Mobile NO.	: 9543917327
	Category	: OBC	Email Id	: booster062@gmail.com
	Roll No.	: BAC/06/2012-13	Present Status	: Admitted in Post Graduate Programme at BAC, Sabour

**Student's Profile****3<sup>rd</sup> Convocation-2017**

- 05 Name of student : Shaheena Parveen Degree : B.Sc. in Agriculture  
Father's name : M Ayaz Uddin OGPA : 8.039  
Address : Surkhikal, Khanjarpur,  
Bhagalpur, Bihar College Name : BAC, Sabour  
Date of Birth : 30/12/1990 Mobile NO. : 9155796808  
Category : OBC Email Id : shaheena8482@gmail.  
Roll No. : BAC/07/2012-13 Present Status : Admitted in Post Graduate  
Programme at BAC, Sabour
- 06 Name of student : Abhishek Prasad Degree : B.Sc. in Agriculture  
Father's name : Late Anirudh Prasad OGPA : 8.032  
Address : c/o, Sadhana Prasad,  
Patel Nagar, DM Colony,  
813210, Nalanda College Name : BAC, Sabour  
Date of Birth : 22/10/1992 Mobile NO. : 9572513313  
Category : OBC Email Id : abhi.bihu22@gmail.com  
Roll No. : BAC/08/2012-13 Present Status : Admitted in Post Graduate  
Programme at BAC, Sabour
- 07 Name of student : Raushan Kumar Degree : B.Sc. in Agriculture  
Father's name : Sri Anil Kumar OGPA : 7.751  
Address : Vill + Po - Bela Simri  
District : Khagaria 851204  
Bihar College Name : BAC, Sabour  
Date of Birth : 10/12/1993 Mobile No. : 8877334224  
Category : OBC Email Id : raushanraj7@gmail.com  
Roll No. : BAC/09/2012-13 Present Status : Employment at Bank
- 08 Name of student : Sneha Shikha Degree : B.Sc. in Agriculture  
Father's name : Sri Yogendra Prasad OGPA : 8.092  
Address : Loco colony, q. No.- 131  
CD chhoti khagaul,  
Patna - 801105 Bihar College Name : BAC, Sabour  
Date of Birth : 06/03/1991 Mobile No. : 8084076157  
Category : OBC Email Id : shikhamaanya@gmail.com  
Roll No. : BAC/10/2012-13 Present Status : Admitted in Post Graduate  
Programme at BAC, Sabour
- 09 Name of student : Neha Kumari Degree : B.Sc. in Agriculture  
Father's name : Sri Arun Prasad Choudhary OGPA : 8.049  
Address : purani durga sthan sultangan

**Student's Profile****3<sup>rd</sup> Convocation-2017**

	District : Bhagalpur813213 Bihar	College Name	: BAC, Sabour
Date of Birth	: 05/03/1992	Mobile No.	: 7209561545
Category	: OBC	Email Id	: nehachoudhary750@gmail.com
Roll No.	: BAC/11/2012-13	Present Status	: Admitted in Post Graduate Programme at BAC, Sabour
10	Name of student : Pooja Kumari	Degree	: B.Sc. in Agriculture
	Father's name : Sri Amrendra Kumar	OGPA	: 7.464
	Address : Village+Po-Sabalapur , PsSonpura District : Saran 800026 Bihar	College Name	: BAC, Sabour
	Date of Birth : 02/03/1992	Mobile No.	: 8540961689
	Category : Gen	Email Id	: poojapihu707@gmail.com
	Roll No. : BAC/12/2012-13	Present Status	: -
11	Name of student : Ravishila Kumari	Degree	: B.Sc. in Agriculture
	Father's name : Sri Ramakant Prasad Singh	OGPA	: 7.871
	Address : Chitragupt,Nagar, khagaria Khagaria	College Name	: BAC, Sabour
	Date of Birth : 18/12/1986	Mobile No.	: 8409448421
	Category : EBC	Email Id	: rk2ravi_1983@hotmail.com
	Roll No. : BAC/13/2012-13	Present Status	: -
12	Name of student : Anshu	Degree	: B.Sc. in Agriculture
	Father's name : Sri Sheesh Kumar	OGPA	: 8.827
	Address : Barari Bhagalpur	College Name	: BAC, Sabour
	Date of Birth : 23/01/1988	Mobile No.	: 9576218242
	Category : OBC	Email Id	: ansuarya58@gmail.com
	Roll No. : BAC/14/2012-13	Present Status	: -
13	Name of student : Raushan Kumar	Degree	: B.Sc. in Agriculture
	Father's name : Sri Rajkumar Ray	OGPA	: 6.765
	Address : At+Post-Kishunpur telaur Vaishali	College Name	: BAC, Sabour
	Date of Birth : 04/05/1993	Mobile No.	: 8084407504
	Category : OBC	Email Id	: bac151213@gmail.com
	Roll No. : BAC/15/2012-13	Present Status	: In Service
14	Name of student : Raman Kumar	Degree	: B.Sc. in Agriculture
	Father's name : Sri Ramesh Ram	OGPA	: 6.421
	Address : Vill + post - kishanpur Baikunth Samastipur	College Name	: BAC, Sabour

**Student's Profile****3<sup>rd</sup> Convocation-2017**

Date of Birth	: 16/01/1988	Mobile No.	: 9973410865
Category	: SC	Email Id	: ramancool1994@gmail.com
Roll No.	: BAC/16/2012-13	Present Status	:
15 Name of student	: Subhash Kumar	Degree	: B.Sc. in Agriculture
Father's name	: Sri Umesh Prasad	OGPA	: 6.709
Address	: Horliganj Jehanabad	College Name	: BAC, Sabour
Date of Birth	: 05/08/1993	Mobile No.	: 9122349388
Category	: OBC	Email Id	: subhashbac17@gmail.com
Roll No.	: BAC/17/2012-13	Present Status	:
16 Name of student	: Md. Aamir	Degree	: B.Sc. in Agriculture
Father's name	: Md Nurshid Ahmed	OGPA	: 7.314
Address	: Pusa Bazar Samastipur	College Name	: BAC, Sabour
Date of Birth	: 12/04/1995	Mobile No.	: 9525346300
Category	: OBC	Email Id	: aamirbux19@gmail.com
Roll No.	: BAC/19/2012-13	Present Status	:
17 Name of student	: Sumit Kumar	Degree	: B.Sc. in Agriculture
Father's name	: Sri Vinod Mandal	OGPA	: 6.510
Address	: AT-Kehanichak Banka	College Name	: BAC, Sabour
Date of Birth	: 02/08/1993	Mobile No.	: 8407884176
Category	: BC	Email Id	: sumit829293@gmail.com
Roll No.	: BAC/20/2012-13	Present Status	: Admitted in Post Graduate Programme at BAC, Sabour
18 Name of student	: Basant Nandan	Degree	: B.Sc. in Agriculture
Father's name	: Sri Pramod Kumar	OGPA	: 7.809
Address	: Rampur Kharahara, ekchari, Kahalgaon, Bhagalpur	College Name	: BAC, Sabour
Date of Birth	: 10/02/1990	Mobile No.	: 9798398983
Category	: OBC	Email Id	: basant591@gmail.com
Roll No.	: BAC/23/2012-13	Present Status	: Admitted in Post Graduate Programme at BAC, Sabour
19 Name of student	: Smriti Sanjayam	Degree	: B.Sc. in Agriculture
Father's name	: Sri Sanjay Kumar	OGPA	: 8.464
Address	: Purani bazar jamui, po - jamui, ps - jamui Jamui	College Name	: BAC, Sabour
Date of Birth	: 04/06/1992	Mobile No.	: 9771880893
Category	: OBC	Email Id	: sanjayamsmriti@gmail.com

**Student's Profile****3<sup>rd</sup> Convocation-2017**

Roll No.	:	BAC/24/2012-13	Present Status	:	-
20	Name of student	: Rekha Kumari	Degree	:	B.Sc. in Agriculture
	Father's name	: Sri Ajay Kumar	OGPA	:	6.964
	Address	: At-Lautan Post : Muraul Muzaffarpur	College Name	:	BAC, Sabour
	Date of Birth	: 10/01/1995	Mobile No.	:	9122898292
	Category	: OBC	Email Id	:	rekha.verma1995doll@gmail.com
	Roll No.	: BAC/25/2012-13	Present Status	:	-
21	Name of student	: Nitu Kumari	Degree	:	B.Sc. in Agriculture
	Father's name	: Sri Anil Kumar Mandal	OGPA	:	8.113
	Address	: Vill-Gareri Tola, Ps & p.o Katihar, Dist- Katihar	College Name	:	BAC, Sabour
	Date of Birth	: 03/01/1990	Mobile No.	:	9430521729
	Category	: EBC	Email Id	:	Nitu123460@gmail.com
	Roll No.	: BAC/29/2012-13	Present Status	:	Admitted in Post Graduate Programme at BAC, Sabour
22	Name of student	: Neha Abhilasha	Degree	:	B.Sc. in Agriculture
	Father's name	: Sri Arbind Kumar	OGPA	:	8.364
	Address	: Village- Badamachak, P.O.- Kumaiitha, PS- Bath, Bhagalpur	College Name	:	BAC, Sabour
	Date of Birth	: 02/12/1992	Mobile No.	:	8862904647
	Category	: OBC	Email Id	:	nehaabhilasha09@gmail.com
	Roll No.	: BAC/31/2012-13	Present Status	:	Admitted in Post Graduate Programme at BAC, Sabour
23	Name of student	: Anant Raj	Degree	:	B.Sc. in Agriculture
	Father's name	: Sri Shyamdeo Mandal	OGPA	:	7.341
	Address	: Jayprakash nagar Purnea college road, Purnea	College Name	:	BAC, Sabour
	Date of Birth	: 31/01/1991	Mobile No.	:	8578856803
	Category	: EBC	Email Id	:	anantrajbau@gmail.com
	Roll No.	: BAC/33/2012-13	Present Status	:	-
24	Name of student	: Mamta	Degree	:	B.Sc. in Agriculture
	Father's name	: Sri Surendra Prasad Chaudhri	OGPA	:	8.155
	Address	: Pasraha Khagaria	College Name	:	BAC, Sabour
	Date of Birth	: 13/03/1994	Mobile No.	:	7250903624
	Category	: OBC	Email Id	:	mamtapriya34@gmail.com
	Roll No.	: BAC/34/2012-13	Present Status	:	-



25	Name of student	: Shriti Moses	Degree	: B.Sc. in Agriculture
	Father's name	: Sri Sunil Kumar Moses	OGPA	: 8.137
	Address	: Sahebganj, church Road PO-champanagar, Bhagalpur	College Name	: BAC, Sabour
	Date of Birth	: 07/10/1990	Mobile No.	: 8757679894
	Category	: ST	Email Id	: mosesshriti07@gmail.com
	Roll No.	: BAC/36/2012-13	Present Status	: -
26	Name of student	: Shivendra Kumar	Degree	: B.Sc. in Agriculture
	Father's name	: Sri Kamlesh Sharma	OGPA	: 7.377
	Address	: village + po - waina , via - kako, P.O -Ghoshi Jehanabad	College Name	: BAC, Sabour
	Date of Birth	: 05/02/1988	Mobile No.	: 8538990576
	Category	: OBC	Email Id	: umarshivendra415@gmail.com
	Roll No.	: BAC/37/2012-13	Present Status	: -
27	Name of student	: Dewranjan Kumar Verma	Degree	: B.Sc. in Agriculture
	Father's name	: Sri Ramjee Prasad Sinha	OGPA	: 7.377
	Address	: At-Pararipar Post-Bhaikh psmakhdumpur Jehanabad	College Name	: BAC, Sabour
	Date of Birth	: 05/08/1986	Mobile No.	: 8409332567
	Category	: OBC	Email Id	: dewranjan2014@gmail.com
	Roll No.	: BAC/38/2012-13	Present Status	: Admitted in Post Graduate Programme at BAC, Sabour
28	Name of student	: Sweta Kumari	Degree	: B.Sc. in Agriculture
	Father's name	: Sri Ramudgar Prasad Rajak	OGPA	: 8.180
	Address	: Mohraghat Pras Khagaria	College Name	: BAC, Sabour
	Date of Birth	: 19/08/1994	Mobile No.	: 9955405777
	Category	: SC	Email Id	: swetadreams39@gmail.com
	Roll No.	: BAC/39/2012-13	Present Status	: Admitted in Post Graduate Programme at BAC, Sabour
29	Name of student	: Intakhab Ahmed	Degree	: B.Sc. in Agriculture
	Father's name	: Md Mojibur Rahman	OGPA	: 7.946
	Address	: Nawabganj Purnia	College Name	: BAC, Sabour
	Date of Birth	: 12/07/1989	Mobile No.	: 9534903344
	Category	: General	Email Id	: iamalik1207@gmail.com
	Roll No.	: BAC/40/2012-13	Present Status	: -

**Student's Profile****3<sup>rd</sup> Convocation-2017**

30	Name of student	: Kajal Kiran	Degree	: B.Sc. in Agriculture
	Father's name	: Sri Kusheshwar Choudhary	OGPA	: 8.036
	Address	: At +Post- Abjuganj , Ps Sultanganj Bhagalpur	College Name	: BAC, Sabour
	Date of Birth	: 26/12/1993	Mobile No.	: 8102317589
	Category	: OBC	Email Id	: kirankajal93@gmail.com
	Roll No.	: BAC/41/2012-13	Present Status	: -
31	Name of student	: Shiv Chandra Dhariya	Degree	: B.Sc. in Agriculture
	Father's name	: Sri Goverdhan Prasad	OGPA	: 7.480
	Address	: Vill-Bajinathganj Jehanabad	College Name	: BAC, Sabour
	Date of Birth	: 06/02/1991	Mobile No.	: 9279797255
	Category	: EBC	Email Id	: shivchandradhariya@gmail.com
	Roll No.	: BAC/43/2012-13	Present Status	: Admitted in Post Graduate Programme at BAC, Sabour
32	Name of student	: Rumi Habiba	Degree	: B.Sc. in Agriculture
	Father's name	: Md.Niyamat Khan	OGPA	: 7.452
	Address	: Mohalla-Mahadeo Math, Rosera Samastipur	College Name	: BAC, Sabour
	Date of Birth	: 15/01/1994	Mobile No.	: 8002423548
	Category	: OBC	Email Id	: rumihabiba1@gmail.com
	Roll No.	: BAC/44/2012-13	Present Status	: -
33	Name of student	: Pankaj Kumar	Degree	: B.Sc. in Agriculture
	Father's name	: Sri Ram Lakhani Saw	OGPA	: 6.839
	Address	: Vill-Ganeshdih , P.O Lodwhay Gaya	College Name	: BAC, Sabour
	Date of Birth	: 09/02/1993	Mobile No.	: 9199185887
	Category	: OBC	Email Id	: pankaj919918@gmail.com
	Roll No.	: BAC/45/2012-13	Present Status	: Admitted in Post Graduate Programme at BAC, Sabour
34	Name of student	: Deepak Ranjan Kishor	Degree	: B.Sc. in Agriculture
	Father's name	: Sri Munnu Rajak	OGPA	: 7.324
	Address	: At+Po- Usmanchak, Ps-Masaurhi Patna	College Name	: BAC, Sabour
	Date of Birth	: 10/12/1988	Mobile No.	: 8409345521
	Category	: SC	Email Id	: dipakkishor2016@gmail.com
	Roll No.	: BAC/46/2012-13	Present Status	:
35	Name of student	: Avinash Sarin Saxena	Degree	: B.Sc. in Agriculture
	Father's name	: Sri Sanjay Kumar	OGPA	: 7.821

**Student's Profile****3<sup>rd</sup> Convocation-2017**

Address	: Dharamraichak Lakhisarai	College Name	: BAC, Sabour
Date of Birth	: 02/01/1988	Mobile No.	: 9304520858
Category	: EBC	Email Id	: avinashsaxena2012@gmail.com
Roll No.	: BAC/47/2012-13	Present Status	:
36 Name of student	: Manish Kumar	Degree	: B.Sc. in Agriculture
Father's name	: Sri RadheshyamChoudhary	OGPA	: 7.238
Address	: devipatty bathnaha Supaul	College Name	: BAC, Sabour
Date of Birth	: 31/01/1988	Mobile No.	: 8405879493
Category	: OBC	Email Id	: bac481213@gmail.com
Roll No.	: BAC/48/2012-13	Present Status	:
37 Name of student	: Juhi	Degree	: B.Sc. in Agriculture
Father's name	: Sri Shashi Kr Sinha	OGPA	: 7.652
Address	: Behind marwari mandir, masjid chowk, hajipur Vaishali	College Name	: B.Sc. in Agriculture
Date of Birth	: 16/02/1990	Mobile No.	: 8083502605
Category	: General	Email Id	: juhi.sinha150@gmail.com
Roll No.	: BAC/49/2012-13	Present Status	:
38 Name of student	: Manish Kumar Jha	Degree	: B.Sc. in Agriculture
Father's name	: Sri Dinesh Jha	OGPA	: 7.721
Address	: vill + post-misi p.s bakhityarpur patna	College Name	: BAC, Sabour
Date of Birth	: 15/01/1991	Mobile No.	: 9122641046
Category	: Genral	Email Id	: shashi521993@gmail.com
Roll No.	: BAC/51/2012-13	Present Status	:
39 Name of student	: Ruby Kumari	Degree	: B.Sc. in Agriculture
Father's name	: Sri Ashok Kumar Gupta	OGPA	: 7.620
Address	: bhram asthan purani bazar ward no= 11 sitamarhi	College Name	: BAC, Sabour
Date of Birth	: 14/08/1992	Mobile No.	: 9572032817
Category	: EBC	Email Id	: rubykm1234@gmail.com
Roll No.	: BAC/52/2012-13	Present Status	:
40 Name of student	: Pawan Kumar Suman	Degree	: B.Sc. in Agriculture
Father's name	: Sri Arun Das	OGPA	: 6.925
Address	: at- dhumgarh pothia post-pothia araria	College Name	: BAC, Sabour
Date of Birth	: 01/02/1994	Mobile No.	: 9973791667
Category	: OBC	Email Id	: pawansuman123@gmail.com

**Student's Profile****3<sup>rd</sup> Convocation-2017**

---

Roll No.	:	BAC/53/2012-13	Present Status	:	In Service	
41	Name of student	:	Ummay Hafsa	Degree	:	B.Sc. in Agriculture
	Father's name	:	Md. Zeyauddin	OGPA	:	8.417
	Address	:	H.No.439,B-Block,Tuiladungri Purba Singhbhum	College Name	:	BAC, Sabour
	Date of Birth	:	19/04/1992	Mobile No.	:	8674891696
	Category	:	OBC	Email Id	:	ummaysweet123@gmail.com
	Roll No.	:	BAC/56/2012-13	Present Status	:	
42	Name of student	:	Pummy Kumari	Degree	:	B.Sc. in Agriculture
	Father's name	:	Sri Umesh Kumar	OGPA	:	6.651
	Address	:	Near Bharat Hal Tent house Purandarpur,Patna 1	College Name	:	BAC, Sabour
	Date of Birth	:	27/02/1992	Mobile No.	:	9431327353
	Category	:	SC	Email Id	:	
	Roll No.	:	BAC/113/2010-11	Present Status	:	
43	Name of student	:	Nilmani Kumari	Degree	:	B.Sc. in Agriculture
	Father's name	:	Sri Parmanand Singh	OGPA	:	6.724
	Address	:	Vill-Dayalpur,Po-Sangitvatta, Ps-Kahalgaoon,Pin-813203	College Name	:	BAC, Sabour
	Date of Birth	:	14/01/1994	Mobile No.	:	9430611393
	Category	:	ST	Email Id	:	
	Roll No.	:	BAC/13/2010-11	Present Status	:	

## LIST OF DEGREE RECIPIENTS OF UNDER GRADUATE PROGRAMME

## BHOLA PASWAN SHASTRI AGRICULTURAL COLLEGE ,PURNEA

- 01 Name of student : Anwasha Dey Degree : B.Sc. in Agriculture  
 Father's name : Sri KashinathDey OGPA : 8.346  
 Address : House No.-2342, H.B.Colony,  
 Sector-3, District- Faridabad  
 (Haryana)-121004 College Name : BPSAC, Purnea  
 Date of Birth : 12/07/1993 Mobile NO. : 8084933896  
 Category : Gen Email Id : anweshadey1993@gmail.com  
 Roll No. : BPSAC/01/2012-13 Present Status : Admitted in Post Graduate  
 Programme at BHU, Varanasi in  
 Deptt. of Agri. Economics
- 02 Name of student : Purnima Singh Degree : B.Sc. in Agriculture  
 Father's name : Sri Ashok Kumar Singh OGPA : 8.248  
 Address : H.N.-23 Bijlee Colony,  
 Anand Nagar, Tahsil-Huzur,  
 District- Bhopal (M.P.) College Name : BPSAC, Purnea  
 Date of Birth : 23/10/1991 Mobile NO. : 8271455458  
 Category : Gen Email Id : purnimasingh2392@gmail.com  
 Roll No. : BPSAC/03/2012-13 Present Status : Admitted in Post Graduate  
 Programme at JNKVV, Jabalpur  
 in the Deptt. of Plant Pathology
- 03 Name of student : Aditya Kumar Degree : B.Sc. in Agriculture  
 Father's name : Sri Maheshwar Mandal OGPA : 7.115  
 Address : Vill.-Ramnagar. P.O.- Chopra  
 Ramnagar, District-Purnea  
 (Bihar) - 854102 College Name : BPSAC, Purnea  
 Date of Birth : 02/12/1984 Mobile No. : 9934853855  
 Category : BC Email Id : aditya.3855@gmail.com  
 Roll No. : BPSAC/05/2012-13 Present Status : Admitted in Post Graduate  
 Programme at Vishwa Bharti in  
 Deptt. of Agronomy
- 04 Name of student : Ajay Kumar Paswan Degree : B.Sc. in Agriculture  
 Father's name : Sri ShivjeePaswan OGPA : 6.805  
 Address : Vill.- PremJiwer,  
 P.O.- Laheriasarai, P.S.- Bahadurpur,  
 District- Darbhanga (Bihar)

**Student's Profile****3<sup>rd</sup> Convocation-2017**

Date of Birth	08/09/1994	College Name	BPSAC, Purnea
Category	SC	Mobile No.	9973333470
Roll No.	BPSAC/06/2012-13	Email Id	ajaykp4654@gmail.com
		Present Status	Admitted in Post Graduate Programme at RAU, Pusa
05 Name of Student	: Priti Kumari	Degree	: B.Sc. in Agriculture
Father's Name	: Sri Rajesh Kumar	OGPA	: 7.588
Address	: Vill.- Shokhara, P.O.-Barauni, P.S.- Phulwaria, District- Begusarai (Bihar)-851112	College Name	: BPSAC, Purnea
Date of Birth	: 02/08/1993	Mobile No.	: 8102971694
Category	: EBC	Email Id	: pritamawani11191@gmail.com
Roll No.	: BPSAC/09/2012-13	Present Status	: Admitted in Post Graduate Programme at BAU, Sabour in Deptt. of Soil Science
06 Name of Student	: Sanjeev Kumar	Degree	: B.Sc. in Agriculture
Father's Name	: Sri Naresh Mandal	OGPA	: 7.268
Address	: Vill. + P.O.-Bhandari, P.O.-Bhandari, P.S.-Belsand, District- Sitamarhi (Bihar)-843316	College Name	: BPSAC, Purnea
Date of Birth	: 07/03/1992	Mobile No.	: 9661211815
Category	: EBC	Email Id	: sanjeevkr162@gmail.com
Roll No.	: BPSAC/10/2012-13	Present Status	: Admitted in Post Graduate Programme at RAU, Pusa in Deptt. of Plant Pathology
07 Name of Student	: Md. MahtabAlam	Degree	: B.Sc. in Agriculture
Father's Name	: Md. Hatim	OGPA	: 6.957
Address	: At: Parmanandpur, Po: Bhogabhatgama, Vil: Ranipatra., Distt: Sadarpurnea - 854337	College Name	: BPSAC, Purnea
Date of Birth	: 05/05/1985	Mobile No.	: 8651265566
Category	: EBC	Email Id	: alam.mahtab062@gmail.com
Roll No.	: BPSAC/13/2012-13	Present Status	: Admitted in Post Graduate Programme at RAU, Pusa in Deptt. of Soil Science

**Student's Profile****3<sup>rd</sup> Convocation-2017**

- 08 Name of Student : Pankaj Kumar Praveen Degree : B.Sc. in Agriculture  
Father's Name : Sri Gita Thakur OGPA : 7.356  
Address : Vill.+P.O.- Jhajhara,  
PS.--KusheshwarAsthan,  
District- Darbhanga  
(Bihar)-848213 College Name : BPSAC, Purnea  
Date of Birth : 11.01.1993 Mobile No. : 8804017603  
Category : EBC Email Id : pankajkumarpraveen2@gmail.com  
Roll No. : BPSAC/14/2012-13 Present Status : Admitted in Post Graduate  
Programme at BAU, Sabour in Deptt. of Entomology
- 09 Name of Student : Neha Kumari Degree : B.Sc. in Agriculture  
Father's Name : Sri Upendra Narayan Diwakar OGPA : 7.190  
Address : Vill.- Chousa, P.O.-Chousa,  
PS.-Chousa, District- Madhepura  
(Bihar)- 852213 College Name : BPSAC, Purnea  
Date of Birth : 02.06.1990 Mobile No. : 9534585376  
Category : EBC Email Id : paplohello@gmail.com  
Roll No. : BPSAC/17/2012-13 Present Status : N. A.
- 10 Name of Student : Kumari Priyanka Degree : B.Sc. in Agriculture  
Father's Name : Sri Umesh Kumar OGPA : 7.487  
Address : Mohalla- outh Church Road,  
P.O.- Head Post Office,  
PS.- Civil Line, District- Gaya  
(Bihar)- 823001 College Name : BPSAC, Purnea  
Date of Birth : 10.10.1991 Mobile No. : 9973165347  
Category : EBC Email Id : pkpriyankakri414@gmail.com  
Roll No. : BPSAC/18/2012-13 Present Status : N. A.
- 11 Name of Student : Himanshukumar Nishad Degree : B.Sc. in Agriculture  
Father's Name : Sri Uday Kumar Nishad OGPA : 6.906  
Address : Vill.+P.O.- Lauwa Lagan,  
PS.- Chausa, District- Madhepura  
(Bihar)- 852213 College Name : BPSAC, Purnea  
Date of Birth : 25.02.1993 Mobile No. : 9939337987  
Category : EBC Email Id : hk25750@gmail.com  
Roll No. : BPSAC/19/2012-13 Present Status : Admitted in Post Graduate  
Programme at RAU, Pusa

**Student's Profile****3<sup>rd</sup> Convocation-2017**

- 12 Name of Student : Ankeshkumar Chanchal Degree : B.Sc. in Agriculture  
Father's Name : Sri Sakaldeo Das OGPA : 6.953  
Address : Vill. + P.O.- Rampur Ratnakar  
alias Sarsai, PS.- Sarai,  
District- Vaishali (Bihar)-844116 College Name : BPSAC, Purnea  
Date of Birth : 09.09.1987 Mobile No. : 886395153  
Category : EBC Email Id : ankeshchanchal@gmail.com  
Roll No. : BPSAC/20/2012-13 Present Status : Admitted in Post Graduate  
Programme at BHU, Varanasi in  
Deptt. of Soil Science
- 13 Name of Student : Md. Mahtab Rashid Degree : B.Sc. in Agriculture  
Father's Name : Md. Mahtab Rashid OGPA : 8.587  
Address : Vill.-Narga, P.O.- Champanagar,  
P.S.- Nathnagar,  
District- Bhagalpur (Bihar)-  
812007 College Name : BPSAC, Purnea  
Date of Birth : 23.01.1993 Mobile No. : 8084009817  
Category : EBC Email Id : mahtabrashid@gmail.com  
Roll No. : BPSAC/21/2012-13 Present Status : Admitted in Post Graduate  
Programme at BHU, Varanasi in  
Deptt. of Plant Pathology
- 14 Name of Student : Md. Zafar Imam Degree : B.Sc. in Agriculture  
Father's Name : Md. Ali Hussain OGPA : 7.601  
Address : Vill.- Laxmipur, P.O.-  
Laxmipur, PS.- Barari,  
District- Katihar (Bihar)-854104 College Name : BPSAC, Purnea  
Date of Birth : 11.02.1994 Mobile No. : 9801893266  
Category : EBC Email Id : zafar.jaydua.imam2@gmail.com  
Roll No. : BPSAC/22/2012-13 Present Status : Admitted in Post Graduate  
Programme at VishwaBharati, in  
Deptt. of Plant Breeding &  
Genetics
- 15 Name of Student : Pooja Rani Degree : B.Sc. in Agriculture  
Father's Name : Sri AlakhNiranjan Srivastava OGPA : 8.318  
Address : Vill.- Bijay Nagar, P.O.- Katihar,  
P.S.- Katihar, District- Katihar  
( Bihar)- 854105 College Name : BPSAC, Purnea  
Date of Birth : 29.12. 1993 Mobile No. : 9097314673  
Category : BC Email Id : pujaagriktr@gmail.com



**Student's Profile****3<sup>rd</sup> Convocation-2017**

Roll No.	: BPSAC/25/2012-13	Present Status	: Admitted in Post Graduate Programme at BAU in Deptt. of Soil Science
16 Name of Student	: Richa Kumari	Degree	: B.Sc. in Agriculture
Father's Name	: Sri Narendra Kumar Nirala	OGPA	: 6.953
Address	: Vill.- Jamalpur, P.O.- New Mahammadpur, P.S.- Koilwar, District- Bhojpur (Bihar)	College Name	: BPSAC, Purnea
Date of Birth	: 16.01.1992	Mobile No.	: 7857958387
Category	: SC	Email Id	: richaswtgal@gmail.com
Roll No.	: BPSAC/26/2012-13	Present Status	: N. A.
17 Name of Student	: Deepika Ranjan	Degree	: B.Sc. in Agriculture
Father's Name	: Late Dr. Vijay Kumar	OGPA	: 7.807
Address	: Mohalla- Digghikala West, P.O.- Digghikala East, P.S.- SadarHajipur, District- Vaishali (Bihar)-844101	College Name	: BPSAC, Purnea
Date of Birth	: 01.05.1993	Mobile No.	: 8935977857
Category	: SC	Email Id	: eepikaranjanbpsac@gmail.com
Roll No.	: BPSAC/28/2012-13	Present Status	: N. A.
18 Name of Student	: Kumar Abhishek	Degree	: B.Sc. in Agriculture
Father's Name	: Sri Arun Kumar	OGPA	: 7.473
Address	: Vill.- Kamla Prasad Lane, Diwan Road, P.O.- Head Office P.S.- Nagar Thana, District- Muzaffarpur (Bihar)- 842001	College Name	: BPSAC, Purnea
Date of Birth	: 03.09.1992	Mobile No.	: 9122042902
Category	: EBC	Email Id	: abhishecool0003@gmail.com
Roll No.	: BPSAC/29/2012-13	Present Status	: Admitted in Post Graduate Programme at VishwaBharati in Deptt. of Horticulture
19 Name of Student	: Surabhi Sinha	Degree	: B.Sc. in Agriculture
Father's Name	: Late Sri Sant Prasad Singh	OGPA	: 8.199
Address	: Vill.- Khankitta, P.O.- Sabour, P.S.-Sabour, District- Bhagalpur (Bihar)- 813210	College Name	: BPSAC, Purnea
Date of Birth	: 06.09.1993	Mobile No.	: 8676044600
Category	: BC	Email Id	: sinhasurabhi66@yahoo.in
Roll No.	: BPSAC/31/2012-13	Present Status	: Admitted in Post Graduate Programme at BAU, Sabour in

**Student's Profile****3<sup>rd</sup> Convocation-2017**

---

					Deptt. of Plant Breeding & Genetics
20	Name of Student :	Dhyanananda Kumari	Degree :	B.Sc. in Agriculture	
	Father's Name :	Sri Ashwini Kumar Yadav	OGPA :	7.290	
	Address :	Vill.- Gopalpur, P.O.- Bahadurpur, P.S.- Zero Mile, Sabour, District- Bhagalpur (Bihar)	College Name :	BPSAC, Purnea	
	Date of Birth :	25.01.1990	Mobile No. :	8102147972	
	Category :	BC	Email Id :	dhyanananda.kumari@rediffmail.com	
	Roll No. :	BPSAC/34/2012-13	Present Status :	Admitted in Post Graduate Programme at BAU, Sabour in Deptt. of Horticulture	
21	Name of Student :	Kumari Madhuri	Degree :	B.Sc. in Agriculture	
	Father's Name :	Sri JanardanPaswan	OGPA :	7.763	
	Address :	Vill. + P.O.- Kamruddinpur, P.S.- Muffasil, District- Begusarai (Bihar)-851134	College Name :	BPSAC, Purnea	
	Date of Birth :	20.09.1989	Mobile No. :	9534167255	
	Category :	SC	Email Id :	kumarimadhuri740@gmail.com	
	Roll No. :	BPSAC/35/2012-13	Present Status :	Admitted in Post Graduate Programme at VishwaBharati in Deptt. of Agriculture Extension	
22	Name of Student :	Shashimala Kumari	Degree :	B.Sc. in Agriculture	
	Father's Name :	Sri Lakhindra Mandal	OGPA :	7.655	
	Address :	Vill.- Kajaha, P.O.- Laukaha, P.S.- Supaul, District- Supaul (Bihar)- 852110	College Name :	BPSAC, Purnea	
	Date of Birth :	03.08.1992	Mobile No. :	8298595898	
	Category :	EBC	Email Id :	shashimalabpsac@gmail.com	
	Roll No. :	BPSAC/37/2012-13	Present Status :	Admitted in Post Graduate Programme at RAU, Pusa in Deptt. of Agronomy	
23	Name of Student :	Soni Kumari	Degree :	B.Sc. in Agriculture	
	Father's Name :	Sri Ramesh Kumar	OGPA :	8.013	
	Address :	Vill. + P.O.-Pansalwa, P.S.- Beldour, District- Khagaria (Bihar)-852161	College Name :	BPSAC, Purnea	
	Date of Birth :	25.02.1992	Mobile No. :	9570528882	
	Category :	BC	Email Id :	bpsackumarisoni2015@gmail.com	

**Student's Profile****3<sup>rd</sup> Convocation-2017**

Roll No.	: BPSAC/38/2012-13	Present Status	: Admitted in Post Graduate Programme at BAU, Sabour in Deptt. of Horticulture
24 Name of Student	: Rupali Kumari	Degree	: B.Sc. in Agriculture
Father's Name	: Sri Ramesh Kumar Singh	OGPA	: 7.919
Address	: Vill.+PO.-Pansalwa, PS.- Beldour, District- Khagaria (Bihar)-852161	College Name	: BPSAC, Purnea
Date of Birth	: 15.03.1991	Mobile No.	: 9570528882
Category	: BC	Email Id	: rupalikumari4920@gmail.com
Roll No.	: BPSAC/39/2012-13	Present Status	: N. A.
25 Name of Student	: Md. Shadab Anjum	Degree	: B.Sc. in Agriculture
Father's Name	: Md. Iftekhar Alam	OGPA	: 7.173
Address	: Vill. + P.O. - Moulanadih, PS.- Chhabilapur, Block- Rajgir, District- Nalanda (Bihar)-803116	College Name	: BPSAC, Purnea
Date of Birth	: 20.01.1988	Mobile No.	: 9473384016
Category	: EBC	Email Id	: shadabanjum76@gmail.com
Roll No.	: BPSAC/03/2011-12	Present Status	: N. A.
26 Name of Student	: Swati Suman	Degree	: B.Sc. in Agriculture
Father's Name	: Sri Siya Ram Mahto	OGPA	: 7.617
Address	: Vill.- Ram Nagar, P.O.- Polytechnic, P.S.- K. Hat, District- Purnea (Bihar)- 854303	College Name	: BPSAC, Purnea
Date of Birth	: 12.01.1990	Mobile No.	: 8083651116
Category	: Gen	Email Id	: swatisuman2k10@gmail.com
Roll No.	: BPSAC/06/2011-12	Present Status	: N. A.
27 Name of Student	: Promod Kumar	Degree	: B.Sc. in Agriculture
Father's Name	: Sri Sarwan Lal Manghi	OGPA	: 7.823
Address	: Vill.- Belsari, P.O.- BalwaKaliyaganj, PS.-Palasi, District- Araria (Bihar)-800004	College Name	: BPSAC, Purnea
Date of Birth	: 17.04.19987	Mobile No.	: 9931493306
Category	: SC	Email Id	: pramodbpsac273@gmail.com
Roll No.	: BPSAC/09/2011-12	Present Status	: Admitted in Post Graduate Programme at CPGS Barapani

**Student's Profile****3<sup>rd</sup> Convocation-2017**

28	Name of Student	: Baban Kumar	Degree	: B.Sc. in Agriculture
	Father's Name	: Sri Deep Narayan Choudhary	OGPA	: 6.439
	Address	: Vill.- Nirpur, P.O.- Dhankul, Via- Patepur, District- Vaishali (Bihar)-843114	College Name	: BPSAC, Purnea
	Date of Birth	: 28.08.1990	Mobile No.	: 9693357628
	Category	: SC	Email Id	: baban.27@gmail.com
	Roll No.	: BPSAC/27/2011-12	Present Status	: N. A.
29	Name of Student	: Amit Kumar	Degree	: B.Sc. in Agriculture
	Father's Name	: Sri Ashok Kumar	OGPA	: 6.856
	Address	: Nandpuri Colony MailaKhad, P.O.- Vitho, P.S.- Chandauti, District- Gaya (Bihar) -823003	College Name	: BPSAC, Purnea
	Date of Birth	: 05.03.1993	Mobile No.	: 8877661592
	Category	: EBC	Email Id	: amitkr93343@gmail.com
	Roll No.	: BPSAC/32/2011-12	Present Status	: N. A.
30	Name of Student	: Arti Kumari	Degree	: B.Sc. in Agriculture
	Father's Name	: Sri Birendra Prasad Mandal	OGPA	: 6.842
	Address	: Vill.- Karhagola Pokhar Tola, P.O.- Karhagola, P.S.- Barari, District- Katihar (Bihar)-854104	College Name	: BPSAC, Purnea
	Date of Birth	: 05.02.1982	Mobile No.	: 9334496977
	Category	: EBC	Email Id	: arti.artikumari1203@gmail.com
	Roll No.	: BPSAC/38/2011-12	Present Status	: N. A.

## LIST OF DEGREE RECIPIENTS OF UNDER GRADUATE PROGRAMME

## MANDAN BHARTI AGRICULTURE COLLEGE, AGWANPUR, SAHARSA

01	Name of student	: Laxman Ram	Degree	: B.Sc. in Agriculture
	Father's name	: Sri Natho Ram	OGPA	: 7.152
	Address	: At- Sujan Pur, Post- Koraiya, Ps- Gadhpura, Dist- Begusarai	College Name	: MBAC, Agwanpur
	Date of Birth	: 07/03/1992	Mobile NO.	: 8434417428
	Category	: SC	Email Id	: laxmanmbac@gmail.com
	Roll No.	: MBAC/01/2012-13	Present Status	: Admitted in M.Sc. (Ag.) BAU, Sabour
02	Name of student	: Pankaj Kumar	Degree	: B.Sc. in Agriculture
	Father's name	: Sri Mithilesh Singh	OGPA	: 8.351
	Address	: Near Utyakarmit Madhya Vidyalaya, Shipha, Bihar Sharif, Nalanda	College Name	: MBAC, Agwanpur
	Date of Birth	: 28/04/1992	Mobile NO.	: 9472607137
	Category	: EBC	Email Id	: pankajkr1212@gmail.com
	Roll No.	: MBAC/02/2012-13	Present Status	: Admitted in M.Sc. (Ag.) RAU, Pusa
03	Name of student	: Devendra Kumar	Degree	: B.Sc. in Agriculture
	Father's name	: Sri Ramdeo Paswan	OGPA	: 7.869
	Address	: At+Po+Ps- Chandi, Dist- Nalanda- 803108, Bihar	College Name	: MBAC, Agwanpur
	Date of Birth	: 05/03/1993	Mobile No.	: 9576413037
	Category	: SC	Email Id	: devendrakumarrt@gmail.com
	Roll No.	: MBAC/04/2012-13	Present Status	: Admitted in M.Sc. (Ag.), BAU, Sabour
04	Name of student	: Ashwini Kumar	Degree	: B.Sc. in Agriculture
	Father's name	: Sri Om Prakash Sah	OGPA	: 7.959
	Address	: Vill- New atwarpur, Po-Kurthol, Ps.-Parsa Bazar, Dist- Patna, Bihar	College Name	: MBAC, Agwanpur
	Date of Birth	: 10/06/1993	Mobile No.	: 8083342012
	Category	: BC	Email Id	: ashwinikmr172@gmail.com
	Roll No.	: MBAC/07/2012-13	Present Status	: Admitted in M.Sc. (Ag.) BAU, Sabour

**Student's Profile****3<sup>rd</sup> Convocation-2017**

05	Name of Student	: Nudrat Sanzida Akhtar	Degree	: B.Sc. in Agriculture
	Father's Name	: Md. Zahid Eqbal	OGPA	: 8.006
	Address	: Vill- Mahammadpur, Po- Teknewal, Ps- Mahammadpur, Dist- Gopalganj, Bihar	College Name	: MBAC, Agwanpur
	Date of Birth	: 10/03/1989	Mobile No.	: 9102471267
	Category	: EBC	Email Id	: n.s.akhtar1947@gmail.com
	Roll No.	: MBAC/08/2012-13	Present Status	: Admitted in M.Sc. (Ag.) RAU, Pusa
06	Name of Student	: Avinash Kumar	Degree	: B.Sc. in Agriculture
	Father's Name	: Sri Chandeshwar Narayan Jha	OGPA	: 8.051
	Address	: Vill- Housing board colony, Q.No. L 77, Po- Laheriasarai, Dist- Darbhanga 84600, Bihar	College Name	: MBAC, Agwanpur
	Date of Birth	: 11/12/1994	Mobile No.	: 9470729899
	Category	: Gen	Email Id	: avinashjhapintu@gmail.com
	Roll No.	: MBAC/09/2012-13	Present Status	: Admitted in M.Sc. (Ag.) RAU, Pusa
07	Name of Student	: Sweeti Kumari	Degree	: B.Sc. in Agriculture
	Father's Name	: Sri Sushil Prasad Singh	OGPA	: 8.046
	Address	: Vill+Po+Ps- Bath, Dist, Bhagalpur 813201, Bihar	College Name	: MBAC, Agwanpur
	Date of Birth	: 01/01/1995	Mobile No.	: 8051460991
	Category	: BC	Email Id	: sweetikrgr@gmail.com
	Roll No.	: MBAC/10/2012-13	Present Status	: Admitted in M.Sc. (Ag.) RAU, Pusa
08	Name of Student	: Nilpana Kumari	Degree	: B.Sc. in Agriculture
	Father's Name	: Late Naresh Prasad	OGPA	: 7.651
	Address	: Vill- Badshapur, Po-Mandana, Dist- Shekhpura, Bihar	College Name	: MBAC, Agwanpur
	Date of Birth	: 06/01/1989	Mobile No.	: 9334186239
	Category	: BC	Email Id	: nil3193@gmail.com
	Roll No.	: MBAC/12/2012-13	Present Status	: Preparation at home
09	Name of Student	: Anand Kumar	Degree	: B.Sc. in Agriculture
	Father's Name	: Sri Mukesh Kumar	OGPA	: 8.248
	Address	: At+Po- Muraul, Via- T.C.A. Dholi, Dist- Muzaffarpur, Bihar	College Name	: MBAC, Agwanpur
	Date of Birth	: 08/02/1995	Mobile No.	: 7250041590
	Category	: BC	Email Id	: anandkumarmuraul1995@gmail.com
	Roll No.	: MBAC/13/2012-13	Present Status	: Admitted in M.Sc. (Ag.) RAU, Pusa

**Student's Profile****3<sup>rd</sup> Convocation-2017**

- 10 Name of Student : Rahul Kumar Degree : B.Sc. in Agriculture  
Father's Name : Shri Kaulshwar Thakur OGPA : 8.324  
Address : Vill- Behrgawan, Po- Bhergawan,  
Ps- Dhanarua, Dist- Patna College Name : MBAC, Agwanpur  
Date of Birth : 03/09/1994 Mobile No. : 7295054299  
Category : EBC Email Id : arunraj9211@gmail.com  
Roll No. : MBAC/14/2012-13 Present Status : Preparation at home
- 11 Name of Student : Abhishek Raj Degree : B.Sc. in Agriculture  
Father's Name : Sri Mahesh Kumar Choudhary OGPA : 8.096  
Address : Vill-Uprawana, Po- Biharsharif,  
Dist- Nalanda, Bihar College Name : MBAC, Agwanpur  
Date of Birth : 08/02/1994 Mobile No. : 9472278238  
Category : SC Email Id : raj.abhishek073@gmail.com  
Roll No. : MBAC/15/2012-13 Present Status : Admitted in M.Sc. (Ag.) BAU,  
Sabour
- 12 Name of Student : Chandan Kumar Degree : B.Sc. in Agriculture  
Father's Name : Sri Dhuruv Baitha OGPA : 7.980  
Address : Vill- HariPakdi, Po- Majhowlia,  
Dist- West Champaran, Bihar College Name : MBAC, Agwanpur  
Date of Birth : 05/09/1993 Mobile No. : 9572845613  
Category : SC Email Id : smr4900@gmail.com  
Roll No. : MBAC/17/2012-13 Present Status : Admitted in M.Sc. (Ag.) RAU,  
Pusa
- 13 Name of Student : Awdhesh Kumar Degree : B.Sc. in Agriculture  
Father's Name : Sri Shankar Yadav OGPA : 8.099  
Address : Vill-Mandhata, Po- Sono,  
Ps- Sono, Jhajha, Dist- Jamui, Bihar 811314 College Name : MBAC, Agwanpur  
Date of Birth : 25/12/1994 Mobile No. : 7739499669  
Category : BC Email Id : awdheshjamui@gmail.com  
Roll No. : MBAC/19/2012-13 Present Status : Admitted in M.Sc. (Ag.) RAU,  
Pusa
- 14 Name of Student : Shyam Kumar Yadav Degree : B.Sc. in Agriculture  
Father's Name : Sri Bishnu Deo Yadav OGPA : 7.824  
Address : Vill +Po- Raje, Via- Sarisab,  
Pahi, Dist- Darbhanga, Bihar College Name : MBAC, Agwanpur  
Date of Birth : 02/07/1988 Mobile No. : 9709387008  
Category : BC Email Id : shyamdbg2013@gmail.com  
Roll No. : MBAC/20/2012-13 Present Status : Preparation at home

### LIST OF DEGREE RECIPIENTS OF UNDER GRADUATE PROGRAMME

#### VEER KUNWAR SINGH COLLEGE OF AGRICULTURE, DUMRAON (BUXAR)

01	Name of student : Rupesh Kumar	Degree : B.Sc. in Agriculture
	Father's name : Satish Kumar Vidyarthi	OGPA : 7.455
	Address : Vill- Deokuli, Po- Bihta, Patna	College Name : VKSC, Dumraon
	Date of Birth : 30.01.1988	Mobile NO. : 9693788189
	Category : SC	Email Id : im.rupesh05@gmail.com
	Roll No. : 01/ C.O.A./2012-13	Present Status : Admitted in M.Sc (Ag) in Plant Breeding, RPCAU, Pusa, Bihar
02	Name of student : Anjali Kumari	Degree : B.Sc. in Agriculture
	Father's name : Manoj Kumar	OGPA : 7.840
	Address : Vill- Khudaganj, Po+Ps- Khudaganj, Nalanda	College Name : VKSC, Dumraon
	Date of Birth : 13.12.1993	Mobile NO. : 8540914277
	Category : BC	Email Id : anjalikumari0312@gmail.com
	Roll No. : 02/ C.O.A./2012-13	Present Status : Admitted in M.Sc (Ag) in Plant Breeding, BAU, Sabour
03	Name of student : Chandan Kumar Bagchi	Degree : B.Sc. in Agriculture
	Father's name : Nakul Ram	OGPA : 7.786
	Address : Vill- Paharpur, Po- Nawgrah, Po- Amas, Gaya	College Name : VKSC, Dumraon
	Date of Birth : 20.11.1991	Mobile No. : 8651019132
	Category : SC	Email Id : chandankumarbagchi7@gmail.com
	Roll No. : 03/ C.O.A./2012-13	Present Status : Admitted in M.Sc (Ag) in Horticulture (Veg.), BAU, Sabour
04	Name of student : Shweta Suman	Degree : B.Sc. in Agriculture
	Father's name : Bindeshwari Prasad Yadav	OGPA : 7.845
	Address : Vill- Lalwamore, Po- Kumarpur, Ps- Phulidumar, Banka	College Name : VKSC, Dumraon
	Date of Birth : 30.11.1991	Mobile No. : 7277534453
	Category : BC	Email Id : shwetasuman3011@gmail.com
	Roll No. : 05/ C.O.A./2012-13	Present Status : Admitted in M.Sc (Ag) in Horticulture (Veg.), BAU, Sabour



**Student's Profile****3<sup>rd</sup> Convocation-2017**

- 05 Name of Student : Rakesh Kumar Rajak Degree : B.Sc. in Agriculture  
Father's Name : Sri Kamleshwar Baitha OGPA : 8.058  
Address : Vill- Tarhe, Po- Karuie, Garhwa College Name : Veer Kunwar Singh College of  
Agriculture, Dumraon  
Date of Birth : 26.11.1993 Mobile No. : 9973370878  
Category : SC Email Id : rksmahi128@gmail.com  
Roll No. : 06/ C.O.A./2012-13 Present Status : Admitted in M.Sc (Ag) in Plant  
Pathology, BHU, Varanasi, U.P
- 06 Name of Student : Rani Kumari Degree : B.Sc. in Agriculture  
Father's Name : Shatrughan Sah OGPA : 8.332  
Address : Vill- Basantpur,  
Po- Pakri Basantpurr, Sitamarhi College Name : Veer Kunwar Singh College of  
Agriculture, Dumraon  
Date of Birth : 10.12.1990 Mobile No. : 7352661119  
Category : BC Email Id : meguptarani@rediff.com  
Roll No. : 07/ C.O.A./2012-13 Present Status : Admitted in M.Sc (Ag) in  
Horticulture (Fruit.), BAU, Sabour
- 07 Name of Student : Manju Kumari Degree : B.Sc. in Agriculture  
Father's Name : Bhagwan Ram OGPA : 7.624  
Address : Vill- Harpur, PO- Khanita,  
PS- Itarhi, Buxar College Name : Veer Kunwar Singh College of  
Agriculture, Dumraon  
Date of Birth : 15.05.1992 Mobile No. : 9097757746  
Category : SC Email Id : manjuquite92@rediffmail.com  
Roll No. : 08/ C.O.A./2012-13 Present Status : Admitted in M.Sc (Ag) in  
Horticulture (Veg.), BAU, Sabour
- 08 Name of Student : Deepak Kumar Degree : B.Sc. in Agriculture  
Father's Name : Shankar Dass OGPA : 7.754  
Address : Fruit Merchant, Paschim Darwaja,  
Ekka Stand, Gulzarbagh, Patna City College Name : Veer Kunwar Singh College of  
Agriculture, Dumraon  
Date of Birth : 01.02.1991 Mobile No. : 7870603565  
Category : EBC Email Id : deepaknnd13@gmail.com  
Roll No. : 09/ C.O.A./2012-13 Present Status :
- 09 Name of Student : Abha Sinha Degree : B.Sc. in Agriculture

**Student's Profile****3<sup>rd</sup> Convocation-2017**

Father's Name	: Surendra Kumar	OGPA	: 8.049
Address	: Bengali tola Mahavir Path, Po+Ps- Patna, Patna	College Name	: VKSC, Dumraon
Date of Birth	: 10.02.1993	Mobile No.	: 8797520168
Category	: BC	Email Id	: mitthimilli93@gmail.com
Roll No.	: 10/ C.O.A./2012-13	Present Status	: Admitted in M.Sc (Ag) in Horticulture (Fruit.), BAU, Sabour
10 Name of Student	: Kumari Superbha Sinha	Degree	: B.Sc. in Agriculture
Father's Name	: Dinesh Prasad Sinha	OGPA	: 7.855
Address	: Vill+Po- Nehalpur, Ps- Parasbigha, Jehanabad	College Name	: VKSC, Dumraon
Date of Birth	: 05.02.1988	Mobile No.	: 9546317225
Category	: BC	Email Id	: suprsbhabhaskar@gmail.com
Roll No.	: 11/ C.O.A./2012-13	Present Status	:
11 Name of Student	: Kumar Sarvjeet	Degree	: B.Sc. in Agriculture
Father's Name	: Ajeet Prasad	OGPA	: 7.435
Address	: Vill-Dhangain, Po+Ps- Bikramganj, Rohtas	College Name	: VKSC, Dumraon
Date of Birth	: 21.03.1992	Mobile No.	: 8540957378
Category	: SC	Email Id	: sarojkumar21392@gmail.com
Roll No.	: 12/ C.O.A./2012-13	Present Status	: Admitted in M.Sc (Ag) in Extension Education, BAU, Sabour
12 Name of Student	: Mani Mesha Nand	Degree	: B.Sc. in Agriculture
Father's Name	: Deep Narayan Singh	OGPA	: 7.558
Address	: Vill-Mishrauliya, Po- Dhoe, Ps- Sadar, Darbhanga	College Name	: VKSC, Dumraon
Date of Birth	: 05.02.1990	Mobile No.	: 9122817200
Category	: BC	Email Id	: manimesha@gmail.com
Roll No.	: 13/ C.O.A./2012-13	Present Status	: Admitted in M.Sc (Ag) in Soil Science, , RPCAU, Pusa, Bihar
13 Name of Student	: Anita Kumari	Degree	: B.Sc. in Agriculture
Father's Name	: Vijay Pd. Singh	OGPA	: 7.840
Address	: Ambedkar Path (Near Teenpulva) Chandpur Bela, Po- G.PO(Patna), Patna	College Name	: VKSC, Dumraon
Date of Birth	: 24.11.1991	Mobile No.	: 9955118395, 9852871892
Category	: EBC	Email Id	: anita478@gmail.com
Roll No.	: 14/ C.O.A./2012-13	Present Status	:

**Student's Profile****3<sup>rd</sup> Convocation-2017**

- 14 Name of Student : Garima Singh Degree : B.Sc. in Agriculture  
Father's Name : Vijendra Singh OGPA : 8.331  
Address : Vill+Po- Sripalpur,  
Ps- Koilwar, Bhojpur College Name : VKSC, Dumraon  
Date of Birth : 02.03.1993 Mobile No. : 9504254859, 9576179532  
Category : GEN. Email Id : cutegary@gmail.com  
Roll No. : 15/ C.O.A./2012-13 Present Status : Admitted in M.Sc (Ag) in  
Agronomy, BAU, Sabour
- 15 Name of Student : Shanu Kumari Degree : B.Sc. in Agriculture  
Father's Name : Lt. Sharwan Kr. Choudhary OGPA : 7.213  
Address : Vill- Shahganj Lane,  
Po- Mahendru, Patna College Name : VKSC, Dumraon  
Date of Birth : 31.12.1990 Mobile No. : 9852320437  
Category : SC Email Id : shanukumari@gmail.com  
Roll No. : 16/ C.O.A./2012-13 Present Status :
- 16 Name of Student : Ashwini Kumar Degree : B.Sc. in Agriculture  
Father's Name : Sri Shiva Narayan Vishwakarma OGPA : 8.085  
Address : West Ashok Nagar Road no. 8  
Strat no.-7 , Kankarbagh, Patna College Name : VKSC, Dumraon  
Date of Birth : 03.01.1993 Mobile No. : 7870663373  
Category : EBC Email Id : ashstranger.kumar@gmail.com  
Roll No. : 17/ C.O.A./2012-13 Present Status : Admitted in M.Sc (Ag) in  
Horticulture (Fruit), BAU, Sabour
- 17 Name of Student : Vinay Kumar Degree : B.Sc. in Agriculture  
Father's Name : Suresh Prasad OGPA : 7.398  
Address : Vill+Ps- Bhagawnpur,  
Ps- Thave, Gopalganj College Name : VKSC, Dumraon  
Date of Birth : 10.02.1990 Mobile No. : 9525643783  
Category : BC Email Id : vinaysingh.kumar962@gmail.com  
Roll No. : 19/ C.O.A./2012-13 Present Status : Admitted in M.Sc (Ag) in Plant  
Pathology, BAU, Sabour

## LIST OF DEGREE RECIPIENTS OF UNDER GRADUATE PROGRAMME

## NALANDA COLLEGE OF HORTICULTURE, NOORSARI

01	Name of student	: Munna Kumar	Degree	: B.Sc. in Horticulture
	Father's name	: Sri Lalan Pandit	OGPA	: 6.785
	Address	: Vill- Akouna, P.O- Chhtiyana, P.S- Makhdumpur, Distt.- Jehanabad , Pin code- 804403	College Name	: Nalanda College of Horticulture
	Date of Birth	: 25-08-1993	Mobile NO.	: 9852139541, 9334923164
	Category	: EBC	Email Id	: munnakumar232@gmail.com
	Roll No.	: COH/16/2011-12	Present Status	:
02	Name of student	: Rozy Kumari	Degree	: B.Sc. in Horticulture
	Father's name	: Sri Rajeev Kumar	OGPA	: 6.794
	Address	: Vill- Kamatbhawanipur, P.S- Rahika, P.O- Madhubanni, Distt.- Madhubanni , Pin Code- 847211	College Name	: Nalanda College Of Horticulture
	Date of Birth	: 15-01-1994	Mobile NO.	: 9473000720
	Category	: SC	Email Id	: sarweshraaz@gmail.com
	Roll No.	: COH/17/2011-12	Present Status	:
03	Name of student	: Md. Mahboob Alam	Degree	: B.Sc. in Horticulture
	Father's name	: Md. Mahmood Alam	OGPA	: 6.700
	Address	: 28, Gopal Gori Lane , Bari Khanjarpur, Distt.- Bhagalpur, Pin Code- 812001	College Name	: Nalanda College Of Horticulture
	Date of Birth	: 24-12-1992	Mobile No.	: 9534272844
	Category	: EBC	Email Id	: mahdubalam405@gmail.com
	Roll No.	: COH/18/2011-12	Present Status	:
04	Name of student	: Saurab Kumar Suman	Degree	: B.Sc. in Horticulture
	Father's name	: Sri Lakshami Kant Singh	OGPA	: 6.702
	Address	: Vill + P.O - Pansalwa, P.S- Beldaur , Distt- Khagariya	College Name	: Nalanda College Of Horticulture
	Date of Birth	: 03-02-1992	Mobile No.	: 9470616469, 9570683983
	Category	: BC	Email Id	:
	Roll No.	: COH/21/2011-12	Present Status	:
			Email Id	: suman.coh@gmail.com

**Student's Profile****3<sup>rd</sup> Convocation-2017**

05	Name of Student	: Rupesh Kumar Mandal	Degree	: B.Sc. in Horticulture
	Father's Name	: Sri Chunchun Mandal	OGPA	: 7.860
	Address	: Railway Quater No-341(B), Dakbangla Para harijanpally PO+PS-Rampurhat, West Bengal	College Name	: Nalanda College Of Horticulture
	Date of Birth	: 22-02-1994	Mobile No.	: 09932307429
	Category	: GEN	Email Id	: rupesh.mandal1993@gmail.com
	Roll No.	: COH/02/2012-13	Present Status	:
06	Name of Student	: Neha Sinha	Degree	: B.Sc. in Horticulture
	Father's Name	: Dr. Shashi Kant Ajay	OGPA	: 7.887
	Address	: H.No-390A/1 Near Karpoori Bhawan Sheikhpura Bagicha , Distt.-Patna, Bihar	College Name	: Nalanda College Of Horticulture
	Date of Birth	: 07-08-1992	Mobile No.	: 9534905545
	Category	: BC	Email Id	: nehasinha1992@yahoo.com
	Roll No.	: COH/03/2012-13	Present Status	:
07	Name of Student	: Ruchika Abha	Degree	: B.Sc. in Horticulture
	Father's Name	: Sri Ram Prasad Choudhary	OGPA	: 7.486
	Address	: Vill- Sahebganj, Post-Champanagar, Distt-Bhagalpur,State- Bihar	College Name	: Nalanda College Of Horticulture
	Date of Birth	: 16-12-1988	Mobile No.	: 9006732675
	Category	: SC	Email Id	: ruchikaabhancoh@gmail.com
	Roll No.	: COH/07/2012-13	Present Status	:
08	Name of Student	: Rakesh Kumar Ranjan	Degree	: B.Sc. in Horticulture
	Father's Name	: Sri Brahmdeo Sharma	OGPA	: 7.424
	Address	: Vill- Bhardiha,Post-Kewatgama, Distt.-Darbhanga, State- Bihar	College Name	: Nalanda College Of Horticulture
	Date of Birth	: 25-12-1991	Mobile No.	: 7870274106, 9546418079
	Category	: BC	Email Id	: kumarrakeshrajn527@gmail.com
	Roll No.	: COH/09/2012-13	Present Status	:

## LIST OF DEGREE RECIPIENTS OF UNDER GRADUATE PROGRAMME

## BIHAR VETERINARY COLLEGE, PATNA

01	Name of student	: Hemant Kumar	Degree	: B.V.Sc. & A.H.
	Father's name	: Sri Jageshwar Ram	OGPA	: 7.968
	Address	: Vill.- Basaiha, PO-Besantalar Palti, PS- Saraiyar, Distt.-Muzaffarpur, Pin-843101	College Name	: Bihar veterinary College, Patna-14
	Date of Birth	: 07.03.1989	Mobile NO.	: 9934839560
	Category	: SC	Email Id	:
	Roll No.	: 06/2011	Present Status	: Admitted in PG at BVC, Patna
02	Name of student	: Ugneshwar Narain Dubey	Degree	: B.V.Sc. & A.H.
	Father's name	: Sri Rajendra Dubey	OGPA	: 6.969
	Address	: Vill.- Tikuliya, PO-Saraiya, PS-Govindganj, Distt.- East Champaran, Pin-845411	College Name	: Bihar veterinary College, Patna-14
	Date of Birth	: 13.12.1986	Mobile NO.	: 9031101993
	Category	: General	Email Id	:
	Roll No.	: 09/2011	Present Status	:
03	Name of student	: Shyam Deo Kumar	Degree	: B.V.Sc. & A.H.
	Father's name	: Sri Basudeo Yadav	OGPA	: 7.163
	Address	: Vill.-Jangipur, PO-Pinjari, Distt.-Sheikhpura	College Name	: Bihar veterinary College, Patna-14
	Date of Birth	: 01.03.1981	Mobile No.	: 9006942425
	Category	: General	Email Id	:
	Roll No.	: 25/2011	Present Status	: Admitted in PG at BVC, Patna
04	Name of student	: Arvind Kumar Singh	Degree	: B.V.Sc. & A.H.
	Father's name	: Sri Shreeniwas Singh	OGPA	: 7.565
	Address	: Vill.-Kamhari, PO-Chandesh, PS- Khudani, Distt.-Kaimpur, Pin-802132	College Name	: Bihar veterinary College, Patna-14
	Date of Birth	: 01.03.1987	Mobile No.	: 9097130997
	Category	: General	Email Id	:
	Roll No.	: 28/2011	Present Status	: Admitted in PG at BVC, Patna
05	Name of Student	: Sushil Kumar	Degree	: B.V.Sc. & A.H.
	Father's Name	: Sri Ramchandra Prasad	OGPA	: 7.650

**Student's Profile****3<sup>rd</sup> Convocation-2017**

Address	: C/o Sangeeta Medical Hall, Vill.+PO-Telhara, Distt.- Nalanda, Pin-801306	College Name	: Bihar veterinary College, Patna-14
Date of Birth	: 20.01.1984	Mobile No.	: 8603287432
Category	: General	Email Id	:
Roll No.	: 30/2011	Present Status	: Admitted in PG at BVC, Patna
06 Name of Student	: Abinash Kumar	Degree	: B.V.Sc. & A.H.
Father's Name	: Sri Ganesh Yadav	OGPA	: 7.709
Address	: Vil.-Khiri, PO-Punakala, PS-Paraiya, Distt.-Gaya, Pin-824209	College Name	: Bihar veterinary College, Patna-14
Date of Birth	: 15.10.1987	Mobile No.	:
Category	: General	Email Id	:
Roll No.	: 33/2011	Present Status	:
07 Name of Student	: Monalisa	Degree	: B.V.Sc. & A.H.
Father's Name	: Sri Udranand Yadav	OGPA	: 7.154
Address	: Vill.-Sheikhpura, Block-Bhargama, PO- Sheikhpura, Distt.-Araria,	College Name	: Bihar veterinary College, Patna-14
Date of Birth	: 15.06.1992	Mobile No.	:
Category	: BC	Email Id	:
Roll No.	: 41/2011	Present Status	:
08 Name of Student	: Arjun Raj	Degree	: B.V.Sc. & A.H.
Father's Name	: Sri Ramashish Prasad Singh	OGPA	: 7.191
Address	: Vill.-Pachpan Par, PO-Nadaul, Subdivision- Masaurhi, Distt.-Patna, Pin-804554	College Name	: Bihar veterinary College, Patna-14
Date of Birth	: 01.06.1992	Mobile No.	:
Category	: General	Email Id	:
Roll No.	: 43/2011	Present Status	:
09 Name of Student	: Ravi Ranjan Kumar	Degree	: B.V.Sc. & A.H.
Father's Name	: Sri Vinay Kumar Roushan	OGPA	: 7.753
Address	: Vill+PO-Prasadi English, Distt.- Arwal, PS- Arwal, Bihar, Pin-804401	College Name	: Bihar veterinary College, Patna-14
Date of Birth	: 15.10.1991	Mobile No.	: 8083469405
Category	: General	Email Id	:
Roll No.	: 53/2011	Present Status	: Admitted in PG at BVC, Patna

## LIST OF DEGREE RECIPIENTS OF UNDER GRADUATE PROGRAMME

## SANJAY GHANDI INSTITUTE OF DAIRY TECHENOLGY, PATNA

01	Name of student	: Mr. Awanish Kumar	Degree	: B. Tech (DT)
	Father's name	: Shri Pankaj Kumar Singh	OGPA	: 7.713
	Address	: Shastri Nagar, Dist. + P.O.- Purnea, State -Bihar. Pin Code- 854301	College Name	: SGIDT, Patna
	Date of Birth	: 16.12.1991	Mobile NO.	: 8271010790
	Category	: General	Email Id	: awanishsgidt8@gmail.com
	Roll No.	: SDT-08/2011	Present Status	: Preparation for higher studies
02	Name of student	: Mr. Pradeep Kumar Choudhary	Degree	: B. Tech (DT)
	Father's name	: Shri Shiv Narayan Choudhary	OGPA	: 6.296
	Address	: Vill- Gourandhra, PO- Andhra Thari, Dist.- Madhubani. Pin Code- 847401	College Name	: SGIDT, Patna
	Date of Birth	: 12.10.1989	Mobile NO.	: 8051877533
	Category	: EBC	Email Id	: pradeepsgidt@gmail.com
	Roll No.	: SDT-16/2011	Present Status	: Jobs at Dairy Plant
03	Name of student	: Mr. Rahul Kumar	Degree	: B.Tech (DT)
	Father's name	: Shri Ram Chandra Singh	OGPA	: 7.471
	Address	: Road No. 4C, Krishna Vihar Colony, Beur, Anishabad, Patna-800002.	College Name	: SGIDT, Patna
	Date of Birth	: 23.12.1992	Mobile No.	: 9693181898
	Category	: General	Email Id	: rahuldevasyaa@gmail.com
	Roll No.	: SDT-02/2012	Present Status	: Preparation for higher studies
04	Name of student	: Mr. Hemant Kumar	Degree	: B.Tech (DT)
	Father's name	: Shri Binay Kumar	OGPA	: 7.414
	Address	: At- Kuwari, P.O.- Harpatee, P.S.- Banmanki, Dist.- Purnea. Pin Code-854102	College Name	: SGIDT, Patna
	Date of Birth	: 25.02.1990	Mobile No.	: 9709725248
	Category	: BC	Email Id	: hemantji4567@gmail.com
	Roll No.	: SDT-03/2012	Present Status	: Preparation for higher studies



**Student's Profile****3<sup>rd</sup> Convocation-2017**

---

05	Name of Student	: Miss Manorama Kumari	Degree	: B.Tech (DT)
	Father's Name	: Shri Ram Krishna Prasad	OGPA	: 8.136
	Address	: At- Sauwan, PO-Raisa, P.S.- Chandi, Dist.- Nalanda (Bihar)	College Name	: SGIDT, Patna
	Date of Birth	: 02.02.1992	Mobile No.	: 9263135558
	Category	: BC	Email Id	: manorama12358@gmail.com
	Roll No.	: SDT-09/2012	Present Status	: Pursuing M. Tech at NDRI, Karnal

**Agricultural Economics**

Name of student	: Priyanka Kumari	Degree	: M.Sc.(Ag) in Economics
Father's name	: Sri Rajendra Kumar	OGPA	: 8.152
Address	: S.K. Puri new area , Nawada	College Name	: BAC, Sabour
Date of Birth	: 27.08.1993	Mobile NO.	: 9122318561
Category	: GENERAL	Email Id	: priyankajee27@gmail.com
Roll No.	: M/Econ/212/BAC/2014-15	Present Status	: -
Name of Advisor	: Dr. Mukesh Kumar Wadhvani		

***Thesis Title : Economics of banana production in  
Bhagalpur district of Bihar***

**ABSTRACT**

Banana is an important fruit crop grown (34310 ha, NHB :2013-14) in the state of Bihar .The state ranks 7<sup>th</sup> in the country in terms of annual production of 1435.78 thousand metric tonne. There are two distinct banana growing areas; viz. old Vaishali region and new North- Eastern (*Kosi*) region, endowed with congenial climatic conditions favourable for growth and development of banana. It is an important source of income and employment for small as well as large category growers.The banana in the state has been reportedly being cultivated under traditional system. It is considered as high feeder crop in terms irrigation and nutritional requirement. Regional variation in costs and returns including resource use efficiency has been found. Further, within the region there is variation among different farm size group. The profitability of the banana production has not been quite substantial due to fluctuating prices and inability of the growers on the part of marketing including post-harvest management. The review of banana production and marketing has revealed that there exist several gaps in the knowledge and information on all the above issues. The banana fruit, which has become an integral component of socio-economic fabric of the people of state, is now facing various constraints. Therefore, in view of obtaining present status of the above aspects present study has been conducted.The study is based on primary data, collected from a sample of 60 banana growers, consisted of 26 (43 %), 25 (42 %) and 9 (15 %) marginal & small, semi-medium and medium & large category. The data were collected from the sample growers with the help of specifically prepared pre-tested schedules through Survey Method by interviewing them, selected through Multi-Stage Sampling Technique from a

cluster of 3 villages of Nawgachia block of Bhagalpur district. The statistical measures like mean, percentage, ratio, frequency distribution etc. were used to accomplish objectives of study. The study revealed that per ha average total cost of cultivation of banana var. *robusta* was found ranging between Rs.1, 00,566.45 on marginal & small farms to Rs.95, 294.42 on medium & large farms. The variable costs included material cost (72.55 %) and labour cost (23.60 %). The material cost was found highest (Rs.72364.71 per ha) on marginal & small farms. The average labour cost was estimated as Rs.22512.93 per ha. The average cost of irrigation and fertilizer constituted 35.59 per cent and 16.01 per cent of total cost, respectively while labour cost constituted of 23.60 per cent. The yield (number of bunches per ha) was found ranging from 2768 to 2847 among three categories of farms and the average price received by the banana growers was Rs. 129.91 per bunch. The average gross income has been estimated as Rs. 3, 64,007.87 per ha, which was ranging in ascending order to size of farms; i.e. higher on large farms and less on marginal farms. The "return to total cost ratio" was estimated at 3.78, which was also in ascending order to size group. The scarcity of labour was considered as the most important limiting factor (88.89 per cent) by medium & large category growers. The non-availability of credit was important to the extent of 88 and 77 per cent by semi-medium and marginal & small growers, respectively. Heavy rainfall as well as frequent cyclone was the major natural calamity due to which their crop was damaged, resulting heavy economic loss to them. There was no provision of crop insurance also. Non-availability of proper market, dominance of pre-harvest contractors, price-fluctuation and no practice of grading were considered as factors affecting banana production by all categories of growers. Most of the quantity of produce is marketed through pre-harvest contractors, which were reported to be their financier. Marketing linkages have not yet been developed and stabilized in the area due to large number of small un-organized banana producers. The growers in general (76.67 %) were found selling banana in 'local market'. The semi-medium and medium & large category (36.0 and 56.0 per cent) growers were also found selling it to 'distant markets'. The 'contract sale' was pre-dominantly prevailed as 'mode of sale' in the area. The 'cash sale' as-well-as 'credit sale' was prevailing in the area. The marginal & small category growers sold banana to the pre-harvest contractors. The study suggest that Banana being heavy feeder and labour intensive nature of crop, the growers should be trained on its nutrient and water management including that of ratoon crop as well as on post-harvest management technology. The predominance of pre-harvest contractors and large number of un-organized marginal & small banana growers restricts growers to harvest benefits of scale of production. Therefore there is need of organizing growers to form Producer Company on the lines of MAHGRAPES, MAHAMANGO, MAHABANANA etc. prevailing in Maharashtra state. After repealing of APMC Act (since 2006) no alternate marketing method has been developed/implemented in the state. Direct marketing by producer to the consumers has been experimented through 'APNI MANDI' in the state of Punjab, Haryana etc. The same may be implemented in Bihar to safeguard the interest of farming community in general, with some modification, if any. Disposal of large quantity of bio-waste in form of pseudo-stem is generated every year poses great problem to banana growers. This can be a source of fiber which has high value in market for its durability and strength. Therefore efforts should be made towards

sustainable waste utilization by extraction of fiber and its conversion into various value added products like bags, wall hangings, pot-hangers, tablemats etc. to the extent possible. Though the State Govt. has launched various programmes under Agriculture Road Map aimed to increase production, productivity and profitability of horticultural crops, their benefits are yet to be harvested by the farming community.

**Agricultural Economics**

Name of student	: Jyoti Bharti	Degree	: M.Sc.(Ag) in Agril. Eco.
Father's name	: Sri Nand Lal Rajak	OGPA	: 8.10
Address	: Supaul	College Name	: BAC, Sabour
Date of Birth	: 27.07.1992	Mobile NO.	: 8407077075
Category	: SC	Email Id	: <a href="mailto:bhartijyoti36@gmail.com">bhartijyoti36@gmail.com</a>
Roll No.	: M/Econ/213/BAC/2014-15	Present Status	: -
Name of Advisor	: Dr. Meera Kumari		

**Thesis Title : A study on vulnerability to agriculture in  
Kosi region of Bihar**

**ABSTRACT**

Climate is the primary determinant of agricultural productivity. Climate change and its impacts are well recognised today and it will affect either physical or biological system. Bihar is highly vulnerable to climate change and variability because vulnerability to climate change is closely related to poverty as the poor are least able to respond to climate change. To cope up with changes in the production system and virtual stagnation of the crop yield the present study on vulnerability to agriculture in Kosi region of Bihar was planned to examine the factors affecting vulnerability and their relationship. The study was also planned to construct vulnerability index and compare different districts of the delineated area in relation to vulnerability index. For this purpose a composite vulnerability index was developed, emphasizing on the three major components namely, (i) Exposure (ii) Sensitivity and (iii) Adaptive capacity. To derive the vulnerability index and draw meaningful inferences both the method of equal and unequal weight were employed. The four major factors of vulnerability were also taken into consideration to assess the temporal and spatial vulnerability. This includes the demographic factors, climatic factors, agricultural factors and occupational factors. Quantitative assessment of vulnerability is usually done by constructing 'vulnerability index'. To construct and compare the vulnerability indices the period from 1976-2015 was subdivided into 4 parts i.e. from 1976-1985, 1986-1995, 1996-2005 and 2006-2015. It means spatial as well as temporal vulnerability was also quantified. For the construction of vulnerability index, simple average score method, Patnaik and Narayanan Method by giving equal weight towards the variable. However, Iyengar and Sudarsan's method and Expert judgement method was also used to construct the vulnerability indices. Next two methods were mainly based on giving unequal weight towards the indicators. It is because some parameters influenced more to the vulnerability and vice-versa. For identification of indicators as well as their relationship

between them trend and pattern of different factors like agriculture, climatic, demographic and occupational factors of eight districts were undertaken for the same and result revealed that those factors falling under sensitive was positively related, however the factors responsible for adaptive capacity were negatively related with vulnerability. The results of investigation revealed that, in the year 1976-1985 the district of Kishanganj ranked first and the district of Araria ranked last (8<sup>th</sup>) in the overall vulnerability to climate change. As for contribution of sources was concerned, the agricultural sector played a significant role in ranking Kishanganj district at the first position by contributing to the tune 34.67 per cent to the overall vulnerability followed by occupational 28.96 per cent, climatic 22.45 per cent, and demographic factors 13.92 per cent. From the period 1986-1995, the district of Kishanganj ranked first in the overall vulnerability to climate change amongst all the selected districts of the region replacing Khagaria district to the second position, followed by Purnea district at the third. In the year 1996-2005, Khagaria district retained its first position with demographic and agricultural indicators being major contributors towards the overall vulnerability to climate change. The values of vulnerability indices varied from 0.30 (Madhepura) to 0.59 (Kishanganj) in 1996-2005 indicating that there was a wide variability in the factors influencing climate change. In the year 2006-2015, the district of Supaul replaced Kishanganj from the first position with reference to overall vulnerability to climate change. Data pertaining to sensitivity component was concerned, that due to reoccurrences of flood leads to damage to the crops or livestock population was found maximum in Kishanganj (21.954) district followed by Araria (21.896) and Purnea (20.882). It implies that Kishanganj was remain stand in first position with respect to sensitivity component of vulnerability was concerned. On the basis of the degree of vulnerability the Kishanganj district was again placed under highly vulnerable district, however the district of Supaul, Saharsa, Madhepura, Purnea and Khagaria were placed under moderate vulnerability whose degree of vulnerability varied from 28.42-73.14 and the district of Araria was considered as least vulnerable district amongst all the selected district under study so far. Its range of vulnerability was varied from 28.58. Therefore climate change policies have to be integrated with sustainable development strategy such as social control, pollution control, as well as emphasis towards regional crop planning for most vulnerable district of Kosi region of Bihar. Since the worst sufferers of climate change impacts are the rural communities, (who depends mainly on agriculture as their livelihoods), it is important to focus on the impacts of climate change on livelihoods, and re-establish the links among poverty, livelihood and environment. However, focusing on the communities only are not enough, and so long as the community initiatives do not become part of the government policies, it is difficult to sustain the efforts. Thus, the link between local, state and national governments to the community is of utmost importance.

**AGRICULTURAL STATISTICS**

Name of student	: Gaurav Kumar Rai	Degree	: M.Sc.(Ag) in Agricultural Statistics
Father's name	: Sri Dinesh Prasad Rai	OGPA	: 8.111
Address	: Vill- Jokahi, Po- samarpur, Ps- Buxar, Dist- Buxar	College Name	: BAC, Sabour
Date of Birth	: 14/11/1993	Mobile NO.	: 8252856563
Category	: General	Email Id	: auravkumarrai30@gmail.com
Roll No.	: M/SMCA/231/BAC/2014-15	Present Status	:
Name of Advisor	: Dr. Basudev Kole		

***Thesis Title : Construction of efficient two-level supersaturated designs***

**ABSTRACT**

Supersaturated designs are factorial designs in which the number of runs (row) is less than the total number of factors (column). They are commonly used in screening experiments, with the objective of identifying screening out the important factors from a large set of potentially active variables. The huge advantage of these designs is that they reduce the experimental cost drastically, but their critical disadvantage is the confounding involved in the statistical analysis. In this thesis work we developed an algorithm for balanced and as well as nearly balanced efficient two levelsupersaturated design, with the help of the algorithms proposed by Nguyen (1996), Lejeune 2003), Ryan and Bulutoglu (2007), Gupta et al. (2008) and Gupta et al. (2010) have been modified to construct efficient SSDs for both balanced as well as nearly balanced cases. The proposed algorithm have been constructed in such a way that it generates an SSD where all the columns are distinct and no column can be generated from any other column. The algorithm generates balanced SSDs for even  $n$  and nearly balanced SSDs for odd  $n$ . The algorithm checks the efficiency of the constructed balanced design by using lower bound to  $E(s^2)$ , given by Das et al. (2008) and nearly balanced design by using the lower bound to  $E(s^2)$  given by Suen and Das (2010). For balanced SSDs, the algorithm has been so constructed that the generated design has less number of orthogonal pair of columns. And for nearly balanced design the constructed design is efficient for all  $E(s^2)$ ,  $r_{max}$  and  $f_{max}$  criterion.

**Agronomy**

Name of student	: Prashant Kumar	Degree	: M.Sc.(Ag) Agronomy
Father's name	: Sri Chandrika Prasad	OGPA	: 8.058
Address	: Vill - Badshahpur Pomandana Sheikhpura	College Name	: BAC, Sabour
Date of Birth	: 07/07/1988	Mobile NO.	: 7870608496
Category	: General	Email Id	: kumarprashant92344@gmail.com
Roll No.	: M/Agro/194/BAC/2014-15	Present Status	: Admitted in Ph.D. Programme at BAC, Sabour
Name of Advisor	: DR. SANJAY KUMAR		

**Thesis Title : Effect of cropping system and establishment methods on performance of rice (*Oryza sativa* L.)**

**ABSTRACT**

Rice (*Oryza sativa* L.) is a grain plant belonging to the family Poaceae and genus *Oryza* with chromosome no. = 24. Rice is one of the most important food grains produced and consumed all over the world. Global rice demand is expected to rise 496 million tonnes in 2020 and further increase to 553 million tonnes in 2035. In Bihar, rice is cultivated in diverse ecosystems spread over 3.3 million ha with a production of 7.7 million tonnes of milled rice and with average productivity of 2.4 tonnes ha<sup>-1</sup>. The increasing demand for rice grain production has to be achieved by using the efficient rice establishment methods with an integration of suitable crop rotation to maintain the sustainability in crop production. Rice seedlings are generally transplanted by hired labour that resulted in labour shortage throughout the transplanting period. Traditionally grown rice by puddled transplanting has provided a heavy levy on the soil health, and under present inputs and technology is likely to fail to meet the projected demand. Therefore there is a need to develop a suitable and efficient alternative system for the current intensive tillage and crop establishment practices. To solve the problem of labour shortage, alternate methods of rice stand establishment are inevitable. Keeping the above view, a study entitled "Effect of cropping systems and establishment method on performance of rice (*Oryza sativa* L.)" was proposed and undertaken during the *Kharif* 2015-16 at Research Farm, Bihar Agricultural University, Sabour, Bhagalpur, Bihar. Treatments were laid out in split plot design replicated thrice. Three rice establishment methods, Zero tillage (T<sub>1</sub>), Permanent bed planting (T<sub>2</sub>) and Transplanted puddled rice (T<sub>3</sub>) were kept in main plot and each main plot is sub-divided in three sub-plots having three cropping systems, rice-wheat (C<sub>1</sub>), rice-maize (C<sub>2</sub>) and rice-lentil (C<sub>3</sub>). Among different establishment methods, the maximum grain (45.4 qha<sup>-1</sup>) and straw (67.21 qha<sup>-1</sup>) yield were recorded under transplanted puddled rice situation which were at par with zero tillage but significantly superior than permanent bed system. Among different cropping system, rice-lentil system recorded



significantly highest grain yield ( $44.63 \text{ qha}^{-1}$ ) than rest of the cropping system. Maximum net return was recorded under zero tillage (Rs. 53,327 ha<sup>-1</sup>) but it was at par with PB and CT. Significantly maximum benefit cost ratio (2.11) was recorded in zero tillage establishment method. Among different cropping systems, rice-lentil recorded maximum net return (Rs.52,089 ha<sup>-1</sup>) and benefit cost ratio (1.93) which was significantly superior than rest of the cropping systems. Soil analysis after harvest of crops revealed that available N, available P<sub>2</sub>O<sub>5</sub> and available K<sub>2</sub>O were significantly higher in permanent bed as compare to ZT and puddled methods whereas among different cropping systems rice-lentil recorded significantly maximum available N, available P<sub>2</sub>O<sub>5</sub> and available K<sub>2</sub>O. Thus the study suggest that for getting higher B:C ratio and net return, among different establishment methods zero tillage and among different cropping systems, rice followed by lentil system may be a good option.

**Agronomy**

Name of student	: Asheesh Chaurasiya	Degree	: M.Sc.(Ag) Agronomy
Father's name	: Sri Suraj Lal	OGPA	: 7.749
Address	: Vill-Kherwa Podalelnager	College	: BAC, Sabour
Date of Birth	: 10/02/1992	Mobile No.	: 9155978323
Category	: OBC	Email Id	: asheeshchaurasiya5189@gmail.com
Roll No.	: M/Agro/193/BAC/2014-15	Present Status	: Admitted in Ph.D.
Name of Advisor	: Dr. R. P. SHARMA		Programme at BAC, Sabour

**Thesis Title : Effect of foliar spray of synthetic compounds for mitigation of heat stress in late sown wheat (*Triticum aestivum* L.)**

**ABSTRACT**

An investigation was carried out to study the effect of foliar spray of synthetic compounds for mitigating heat stress in late sown wheat and to increase the growth and yield of wheat when sowing of wheat often gets delayed. Under rice-wheat cropping system due to late harvesting of rice and consequently abruptly rise in temperature beyond 20° C which coincides with anthesis and grain filling period of wheat resulting in heavy yield reduction. Therefore, a field experiment was carried out in the sandy loam soil of the experimental farm of Bihar Agricultural University, Sabour, Bhagalpur during the *rabi* season of 2014-15 to test the efficacy of synthetic compounds in improving grain yield and mitigating high temperature stress in late sown wheat. Treatments were laid out in split plot design with three replications. Two contrasting varieties of wheat, i.e., DBW-14 ( $V_1$ ) and K 307 ( $V_2$ ), meant for timely and late sown irrigated condition in the region were kept in main plots. Each main plot was further sub-divided into fourteen subplots which received foliar spray of different synthetic compounds either at a fixed dose in booting or in anthesis stage or half the fixed dose in both booting and anthesis stage and were compared with control which received no foliar spray. The foliar spray was as follows:  $M_1$ : No foliar spray,  $M_2$ :Foliar spray of  $KNO_3$  (1.0 %) at booting stage,  $M_3$ : Foliar spray of  $KNO_3$  (1.0 %) at anthesis stage,  $M_4$ : Foliar spray of  $KNO_3$  (0.5 %) both at booting & anthesis stage,  $M_5$ : Foliar spray of  $CaCl_2$  (0.2%) at booting stage,  $M_6$ : Foliar spray of  $CaCl_2$  (0.2%) at anthesis stage,  $M_7$ : Foliar spray of  $CaCl_2$  (0.1%) both at booting & anthesis stage,  $M_8$ : Foliar spray of Glycine betaine (100 mM) at booting stage,  $M_9$ :Foliar spray of Glycine betaine (100 mM) at anthesis stage,  $M_{10}$ :Foliar spray of Glycine betaine (50mM) both at booting & anthesis stage,  $M_{11}$ : Foliar spray of Arginine (2.5mM) at booting stage,  $M_{12}$ : Foliar spray of Arginine (2.5mM) at anthesis stage,  $M_{13}$ : Foliar spray of Arginine (1.25mM) both at

booting & anthesis stage and  $M_{14}$  : Foliar spray of water both at heading & anthesis stage. For assessing physiological and biochemical parameters, flag leaf was sampled from each plot two days after each spray and estimation was done as per standard procedure. Result shows that grain yield was increased significantly and maximized (36.96 and 31.23 qha<sup>-1</sup> for  $V_1$  and  $V_2$  respectively) when the crop received foliar spray of  $KNO_3$  at the rate of 0.5% both during booting and anthesis stage over no foliar spray (31.51 and 29.92 qha<sup>-1</sup> for  $V_1$  and  $V_2$  respectively) and was found to be statistically at par with single foliar spray of  $KNO_3$  at the rate of 1% only during anthesis stage (36.52 and 30.63 qha<sup>-1</sup> for  $V_1$  and  $V_2$  respectively). The corresponding values with the foliar spray of  $CaCl_2$  showed same trend like  $KNO_3$  and were found to be statistically at par. Besides, foliar spray of  $KNO_3$  at the rate of 0.5% both during booting and anthesis maintained significantly higher flag-leaf chlorophyll content during anthesis (5.86 mgg<sup>-1</sup> of fresh weight) and grain filling (4.43 mgg<sup>-1</sup> of fresh weight) over control (5.21 and 3.78 mgg<sup>-1</sup> of fresh weight during anthesis and grain filling period, respectively) as well as maintained significantly lower level of electrolytic leakage (39.60 and 54.17%) and proline content (6.81 and 9.01  $\mu$  mole g<sup>-1</sup> of fresh weight) during the same point of time over control (electrolyte leakage: 50.64 and 65.20% during anthesis and grain filling period respectively and proline content: 8.19 and 10.39  $\mu$  mole g<sup>-1</sup> of fresh weight during anthesis and grain filling period, respectively) indicating lower degree of stress and higher heat tolerance capacity. Economic analysis revealed that the foliar spray of  $KNO_3$  at the rate of 0.5% both during booting and anthesis in DBW-14 significantly increased and maximized B: C ratio (1.9) over control (1.72) but did not respond significantly in K 307. Thus, the study suggests that foliar spray of  $KNO_3$  at the rate of 0.5% both during booting and anthesis in a short duration variety like DBW-14 is beneficial to mitigate the ill effects of high temperature stress and enhance the yield to a profitable limit.

**Agronomy**

Name of student	: Prince Kumar	Degree	: M.Sc.(Ag) in Agronomy
Father's name	: Sri Sanjay KumarSingh	OGPA	: 8.060
Address	: Vill+Post- Rasalpur	College Name	: BAC, Sabour
Date of Birth	: 25/05/1992	Mobile No.	: 8540028041
Category	: Genral	Email Id	: <a href="mailto:prince2n4u@gmail.com">prince2n4u@gmail.com</a>
Roll No.	: M/Agro/328/BAC/2014-15	Present Status	: Admitted in Ph.D.
Name of Advisor	: Dr. S. Sheraz Mahdi	Programme at	BAC, Sabour

**Thesis Title : Effect of crop establishment methods and nutrient management practices on growth, yield and economics of rice (*Oryza sativa* L.)**

**ABSTRACT**

A field experiment was conducted at Research Farm, Bihar Agricultural university, Sabour during *Kharif* 2015 in Split Plot Design with three Crop Establishment Methods viz. System of Rice Intensification (M<sub>1</sub>), Transplanted Rice (M<sub>2</sub>) and Direct Seeded Rice (M<sub>3</sub>) and four Nutrient Management Practices viz. 100% inorganic fertilizer (S<sub>1</sub>), 75% inorganic + 25% organic (S<sub>2</sub>), 50% inorganic +50% organic (S<sub>3</sub>) and 100% inorganic +green manuring (S<sub>4</sub>) replicated thrice. The plots were given uniform recommended dose of phosphorus and potassium @ of 60 and 40 kg P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O ha<sup>-1</sup> respectively, during the crop season. Analyzed data revealed that among the different rice establishment methods, system of rice intensification significantly increased all the growth attributes viz. no. of tillers, dry matter production, leaf area index, CGR at different stages of crop growth except the plant height which was recorded significantly higher in case of direct seeded rice (M<sub>3</sub>). The yield attributing characters viz., effective tillers, panicle length, no. of grains per panicle, 1000 grain weight and grain and straw yield was also recorded maximum when crop was grown under system of rice intensification method. NPK content was not significantly affected by different crop establishment methods, however, their uptake was recorded maximum under system of rice intensification. Different crop establishment methods did not caused any marked difference in all soil parameters studied. At different crop growth stages, 100% inorganic fertilizer (S<sub>1</sub>) and 100% inorganic + green manuring (S<sub>4</sub>) at par with one another significantly increased all the growth characters viz. plant height, no. of tillers, dry matter production, leaf area index, CGR. The yield attributing characters viz., effective tillers, panicle length, no. of grains per panicle, 1000 grain weight and grain and straw yield was

also recorded maximum in plots receiving the 100% inorganic + green manuring ( $S_4$ ). However,  $S_4$  and  $S_3$  did not differ significantly in this respect also. NPK content was not significantly affected by different nutrient management practices, however, grain, straw and total nutrient uptake was recorded maximum under  $S_1$  and  $S_4$ . Different nutrient management practices did not caused any marked difference in all soil parameters. From the economics point of view, highest gross and net returns were realized with treatment combination  $M_1S_4$  (SRI and 100% inorganic fertilizer +GM), whereas, benefit-cost ratio was highest with treatment combination  $M_3S_1$  (DSR and 100% inorganic). However,  $M_1S_4$  did not differ significantly in this respect. The results of the one year study lead to conclusion that for realizing higher and sustainable yield, crop must be established following system of rice intensification and the nutrient management must centre around 100% inorganic + green manuring. However, to reach a specific conclusion and recommendation the same experiment need to be repeated and should be done over different Agro-climatic zones of Bihar.

**Agronomy**

Name of student	: Arvind Bhai Patel	Degree	: M.Sc.(Ag) in the subject of Agronomy
Father's name	: Sri Hari Sharan Patel	OGPA	: 7.563
Address	: Vill. Dharpura Panna	College Name	: BAC, Sabour
Date of Birth	: 10/12/1990	Mobile NO.	: 8271586580
Category	: OBC	Email Id	: <a href="mailto:Arvindagro7@gmail.com">Arvindagro7@gmail.com</a>
Roll No.	: M/Agro/195/BAC/2014-15	Present Status	: Admitted in Ph.D. Programme at BAC, Sabour
Name of Advisor	: Dr. S. K.GUPTA		

***Thesis Title : Studies on nitrogen and zinc management for fodder production of maize (Zea mays L.)***

**ABSTRACT**

Field experiment was conducted at Research Farm, Department of Agronomy, Bihar Agricultural College, Sabour, Bhagalpur (Bihar). during *Kharif*- 2015 on siltyloam soil (low in available nitrogen, zinc, available phosphorus and medium in available potassium with neutral pH), to study the response of fodder maize to levels of nitrogen, and zinc. The experiment was laid out in Factorial Randomized Block Design with three nitrogen levels ( $N_1$ -90 kg ha<sup>-1</sup>,  $N_2$ -120 kg ha<sup>-1</sup> and  $N_3$ -150 kg ha<sup>-1</sup>) and three zinc levels ( $Zn_1$ -0 kg ha<sup>-1</sup>,  $Zn_2$ -10 kg ha<sup>-1</sup> and  $Zn_3$ -20 kg ha<sup>-1</sup>), replicated thrice. The plots were given uniform recommended dose of phosphorus and potassium @ of 60 and 40 kg P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O ha<sup>-1</sup>, respectively, during experimentation. Application of 150 kg N ha<sup>-1</sup> significantly increased the plant height, leaf area index, dry matter production, and chlorophyll content plant<sup>-1</sup> at different crop growth periods of fodder maize during experimentation. Stem diameter showed significant and consistent increase, with increase in nitrogen application from 90 to 150 kg ha<sup>-1</sup>. Both green and dry fodder yield, nitrogen and zinc content and their uptake recorded significant increase with increase in levels of nitrogen up to 150 kg ha<sup>-1</sup>. Crude protein content and yield showed significant increase, whereas, crude fiber content and yield showed significant and consistent decrease up to 150 kg N ha<sup>-1</sup>. Zinc application at 20 kg ha<sup>-1</sup> recorded higher values of all the growth characters studies viz. plant height, leaf area index, dry matter production, chlorophyll content and stem diameter over no zinc application at all crop growth stages. Green and dry fodder yield also increased remarkably with zinc application @ 20 kg ha<sup>-1</sup>. However,  $Zn_{20}$  did not differ significantly with  $Zn_{10}$  in this regard. Higher nitrogen zinc content, their uptake, crude protein content, its yield was also recorded with application of Zn @ 20 kg ha<sup>-1</sup>. Nitrogen application at the

rate 150 kg ha<sup>-1</sup> recorded the available nitrogen of 210.67 kg ha<sup>-1</sup> in the soil after crop harvest which was higher than initial nitrogen content of 210 kg ha<sup>-1</sup>. Available zinc in the soil after crop harvest ranged from 0.95 to 1.33 ppm as against initial zinc balance of 0.56. As such there was a positive balance of zinc in the soil after crop harvest. Highest gross return and net return were recorded with treatment combination N<sub>150</sub>Zn<sub>20</sub>. However, highest benefit cost ratio was realized with treatment combination N<sub>150</sub>Zn<sub>10</sub>. Thus the study lead to conclusion, that for realizing the highest yield and quality fodder maize, the nutrient management mast center a rounded 150 kg N and Zn10 kg ha<sup>-1</sup> along with recommended dose of phosphorus (60 kg ha<sup>-1</sup>) and potassium (40 kg ha<sup>-1</sup>).

**Entomology**

Name of student	: Vikas Kumar Patel	Degree	: M.Sc.(Ag) in Ag. Entomology
Father's name	: Sri Subash Chandra	OGPA	: 8.824
Address	: At- Pratappur Po+Ps - Mirzamurad Dis- Varanasi (U.P.)- 221307	College Name	: BAC, Sabour
Date of Birth	: 15.06.1991	Mobile NO.	: 08954181759
Category	: OBC	Email Id	: patel.varanasi91@gmail.com
Roll No.	: M/Ento/186/BAC/2014-15	Present Status	:
Name of Advisor	Dr Anil		

**Thesis Title : Population dynamics and management of yellow stem borer, *Scirpophaga incertulas* (Walker) in aromatic rice**

**ABSTRACT**

*Scirpophaga incertulas* (Lepidoptera: Pyralidae) is one of the major insect-pests causing serious losses in rice and the incidence of insect-pests is comparatively more in aromatic rice. The investigation on population dynamics and management of *S. incertulas* in aromatic rice was conducted during Kharif, 2015. The adults of *S. incertulas* were found to be active during 29th to 44th standard meteorological weeks (SMWs), whereas infestation was noticed during 34 to 44 SMWs. The maximum pheromone trap catch (9.80 moths/trap/week) and light trap catch (46.00 moths/trap/week) were obtained during 38th SMW. Temperature (maximum & minimum), relative humidity (maximum & minimum) and rainfall were found to be positively correlated with the population dynamics of *S. incertulas*, whereas Sunshine hours were found to be negatively correlated. All the insecticides were found to be superior in efficacy over the untreated check. Chlorantraniliprole 18.5 SC was proved to be the most effective insecticide which resulted in 4.45 per cent dead heart (DH) and 5.55 per cent white ear head (WEH) followed by fipronil 5 SC (4.79% DH, 5.92% WEH) and cartap hydrochloride 50 SP (5.09% DH, 6.74% WEH). Moderate level of efficacy (5.47% DH, 6.93% WEH) was obtained with flubendiamide 20 WG followed by indoxacarb 15.8 EC (5.65% DH, 6.97% WEH) and spinosad 45 SC (5.90% DH, 7.03% WEH). The lowest level of efficacy (7.44% DH, 8.30% WEH) was recorded in novaluron 10 EC followed by monocrotophos 36 SL (6.87% DH, 7.70% WEH) and triazophos 40 EC (6.61% DH, 7.48% WEH). Being at par with each other, all the insecticides were found to significantly reduce the mean population of natural enemies after first and second sprays over the untreated check and. Monocrotophos was found to be the relatively less toxic to the spiders followed by flubendiamide/fipronil and triazophos, whereas chlorantraniliprole and indoxacarb were found to be the more toxic to the spiders followed by spinosad and novaluron. However, spinosad was found to be less toxic to the dragonflies and damselflies followed by novaluron and cartap hydrochloride. Monocrotophos was found to be more toxic to the dragonflies and damselflies followed by fipronil and



chlorantraniliprole. The order of persistent toxicity against neonate larvae of *S. incertulas* was observed as chlorantraniliprole > fipronil > flubendiamide > cartap hydrochloride > indoxacarb > triazophos > monocrotophos = spinosad > novaluron. The maximum incremental yield (6.30 q ha<sup>-1</sup>) was obtained with chlorantraniliprole followed by fipronil (5.99 q ha<sup>-1</sup>) and cartap hydrochloride (5.49 q ha<sup>-1</sup>). The minimum incremental yield (4.17 q ha<sup>-1</sup>) was obtained with novaluron followed by monocrotophos (4.32 q ha<sup>-1</sup>) and triazophos (4.50 q ha<sup>-1</sup>). However, the maximum cost-benefit ratio (1:3.05) was obtained with triazophos followed by fipronil (1:2.12), monocrotophos (1:2.09) and cartap hydrochloride (1:2.07). The cost benefit ratio was lowest (1:0.02) with novaluron followed by spinosad (1:0.42) and chlorantraniliprole (1:0.74).

**Entomology**

Name of student	: Santosh Mandal	Degree	: M.Sc.(Ag) in the subject of Entomology
Father's name	: Sri Kapil Dev Mandal	OGPA	: 7.582
Address	: AT+ PO- Bakiya Diyara, Barari Ktr College	Name	: BAC, Sabour
Date of Birth	: 13/02/1989	Mobile NO.	: 8969271906
Category	: ST	Email Id	: entosm@gmail.com
Roll No.	: M/Ento/187/BAC/2014-15	Present Status	: Job in Bank
Name of Advisor	Dr.Ramanuj Vishwakarma		

**Thesis Title : Population dynamics and laboratory evaluation of some botanicals against greater waxmoth (*Galleria Mellonella L.*)**

**ABSTRACT**

Quite a good number of enemies often cause appreciable damage to honeybees round the year and particularly during the floral dearth period, posing threat to beekeeping industry (Singh, 1975). Amongst enemies, the greater wax moth, *Galleriamellonella L.* (Lepidoptera: Pyralidae) is the most devastating and economically important pest of combs and hive products of *Apis mellifera* in the world. The caterpillars of wax moth feed on combs, pollen, larval exuviae and other proteinaceous matter both in storage as well as in live honeybee colonies (Caron, 1999). Keeping this view in mind, the present investigation was aimed to know the population dynamics and effect of some botanicals against *G. mellonella*. Experiments were carried out at Beekeeping-cum-Honey Production Unit and Laboratory of the Department of Entomology, Bihar Agricultural College, Bihar Agricultural University, Sabour (Bhagalpur), Bihar, India, during dearth period of 2015. There were three empty colonies of *A. mellifera* having four frames in each colony selected randomly at said unit. The observations on number of eggs, larvae, pupae and adults of greater wax moth present in colony were recorded at weekly intervals. Therectangular pieces of uninfested old comb (size 50cm<sup>3</sup>/piece) dipped/dusted with neem oil (3%) @ 3ml/piece, neem seed kernel extract (4%) @ 3ml/piece, dried neem leaf powder @ 3g/piece, citronella oil (3%) @ 3ml/piece, garlic clove extract (4%) @ 3ml/piece, dried tobacco leaf powder @ 3g/piece and tulsi leaf extract (4%) @ 3ml/piece in three replication. Ten fresh wax moth larvae were released in each jar and mortality recorded at different exposure period of 1, 2, 3, 5, 7 and 10 days after releasing. The highest range of number of eggs (8.00-9.00), larvae (16.67-26.33), pupae (21.33-23.67) and adults (7.33-8.00) of greater wax moth were observed between 36th to 39th standard week (SW), but, these were not significantly differ to each other. The larval population of wax moth was observed six times more in 37th SW as compared to 23rd SW and 52nd SW. However, the peak population of wax moth larvae was observed in the month of September during dearth period. The correlation of numbers of egg clusters, larvae and pupae of greater wax moth were found to be positively significant with maximum temperature ( $r=0.227^*$ ,  $0.292^{**}$  and  $0.301^{**}$ ), respectively, while it was non-significant with the adults population. There was positive significant correlation of wax moth eggs, larvae,

pupae and adults with minimum temperature and relative humidity. However, none of the life stages of wax moth were found to be positively significant with maximum relative humidity and rainfall, except adult stage. From mean data of two sprays, the highest larval mortality was 81.67% observed in the treatment with Citronella oil 3% @ 3ml/ 50cm<sup>3</sup> wax comb piece. However, the larval mortality of *G. mellonella* was 4.00 times, 3.67 times, 3.78 times, 4.44 times, 4.11 times, 4.22 times and 3.78 times more with the treatment neem oil (3%) @ 3ml, neem seed kernel extract (4%) @ 3ml, dried neem leaf powder @ 3g, citronella oil (3%) @ 3ml, garlic clove extract (4%) @ 3ml, dried tobacco leaf powder @ 3g and tulsi leaf extract (4%) @ 3ml as compared to control. The order of efficacy, based on the results achieved under laboratory conditions was found to be citronella oil 3% > dried tobacco leaf powder > garlic clove extract 4% > neem oil 3% > dried neem leaf powder > tulsi leaf extract 4% > neem seed kernel extract 4%.

**Entomology**

Name of Student	: Chandan Kumar	Degree	: M.Sc. (Ag) in Entomology
Father's name	: Sri Bramhadev Prashad Singh	OGPA	: 8.273
Address	: Basudeopur, Kalyanpur, SamastipurCollege	Name	: BAC, Sabour
Date of Birth	: 09.08.1993	Mobile No.	: 8541808847
Category	: OBC	Email Id	: chandanento@gmail.com
Roll No.	: M/Ento/188/BAC/2014-15	Present Status	: Bank Employee
Name of Advisor	: Dr. S. N. Ray		

***Thesis Title : Studies on insect-pests and pollinators of guava and eco-friendly management of fruit files***

**ABSTRACT**

The Guava (*Psidium guajava*) belongs to the family of Myrtaceae. It is a very rich source of vitamin C (Mahmood, 1994). Guava, the "poor man's fruit" or "apple of the tropics" was a popular tree fruit of the tropical and subtropical climates. About 80 species of insects have been recorded on guava trees, affecting yield and quality of fruits. Fruit flies, castor capsule borer, mealy bug, whiteflies and coccids (scale insects and mealy bugs) are considered as major pest of guava, while aphids, thrips, cockchafers, stem borers and fruit borers, etc., are the minor pests (NHM, 2012). The infestation of fruit fly is a major limiting factor in production of guava. Apart from these pollinators are also playing an important role in the production of guava. Considering the above background information in view, the present experiment was undertaken on "Studies on seasonal incidence of insect-pest and pollinators in guava and eco-friendly management of fruit fly" with the objectives i. To study the seasonal infestation of insect-pests of guava, ii. To record the diversity and activity of pollinators in guava and iii. To evaluate different traps for fruit fly management.

The incidence of fruit flies was recorded as high as from second week of June to August and the peak population was recorded at 32nd standard week (August). Among different species of Bactrocera, the highest population was recorded with *B. dorsalis* followed by *B. zonata* and *B. correcta*. The incidence of mealy bug was observed as high as from second fortnight of January to second fortnight of February, while castor capsule borer peak incidence was recorded at 49th standard week (December). Regarding diversity of pollinators are concerned, a total of four species of *Apis* were observed in the field pollinating the guava flower namely Little bee, *Apis florea*; Rock bee, *A. dorsata*, Italian bee, *A. mellifera*, Indian bee, *A. cerana indica*. In addition to, coccinellid and hover fly were also observed in the flowers of guava. *A. mellifera* was recorded as the most abundant pollinator of guava flowers based on the number of visit observed. The maximum pollinators were visited the guava flowers during 0700 hr followed by 1000 hr. Three traps viz: Sabour trap, Water trap and Nomate trap along with untreated control were taken for the

management of fruit flies. Among the traps, Sabour trap performed well as compared to other traps based reduction of fruit damage both wt. and no. basis and simultaneously obtained highest yield as compared to others. The highest cost-benefit ratio was obtained with Sabour trap (1:18.71) followed by water trap (1:8.97).

**Extension Education**

Name of student	: Tarun Kumar	Degree	: M.Sc. (Ag.) in Extension Education
Father's name	: Sri Bhuneshwar Prasad.	OGPA	: 8.009
Address	: At- Sarbahana, P.O.- Tarwan P.S. – Wazirganj, Distt- Gaya (Bihar)- 805128		
College Name	: B.A.C., Sabour	Date of Birth	: 06/01/1990
Mobile NO.	: 08755060111	Category	: EBC
Email Id	: tarun2n4u@gmail.com	Roll No.	: M/Ext.Edu./189 /BAC/2014-15
Name of Advisor	Dr. S.R.Singh	Present Status	: Job in Bank

***Thesis Title : Factors Affecting Development of  
Agri-entrepreneurship in Bhagalpur District of Bihar***

**ABSTRACT**

The present study entitled "Factors Affecting Development of Agri-entrepreneurship in Bhagalpur District of Bihar" focused on factors responsible for development of agri-entrepreneurship.

For this study Bhagalpur District of Bihar state was purposively selected. The list of agri-entrepreneur from five agri-based enterprise like dairy, mushroom grower, poultry, nursery grower, beekeeping were collected from the different sources like wise Krishi vigyan Kendra, line departments of agriculture, agriculture college, The Bihar State Milk Co-Operative Federation Ltd, Agricultural Technology Management Agency, National Bank for Agriculture and Rural Development. From this list of agri-entrepreneurs, twenty respondents were selected randomly from each agri-based enterprise; hence the sample size was 100.

Analysis of demographic profile of respondents indicated that majority of the respondent were middle age group, general category, having intermediate level of education, more than four members in family size, marginal land holding, annual income up to 1 lacs, low level of self confidence, high level of innovativeness, medium level of achievement motivation and low level of institutional support. It was noted that maximum respondents have their own enterprises and most of them received training. It was also noted maximum entrepreneurial had less than five years of entrepreneurial experience. Respondents also have high level of planning orientation, production orientation and medium level of marketing orientation.

It was noted that entrepreneurial decision making of the respondents was positively and significantly correlated with the independent variable training received, entrepreneurial experience, planning orientation, technical and managerial constraints. Annual income of respondents was positively and significantly correlated with the variable entrepreneurial experience and land holding. Achievement motivation is the pivotal of any successful enterprise

establishment and continuation and it was interesting to note that loan received is positively and significantly correlated with the dependent variable i.e., achievement motivation of the entrepreneurs. Establishment of large number of Agricultural entrepreneurship is a need of Bihar State. However, the rate of establishment and success is limited due to a large number of constraints. In order to make an in-depth enquiry into this issue, the present study was planned on the problem entitled, "Factors Affecting Development of Agri-entrepreneurship in Bhagalpur District of Bihar".

Major constraints faced by the nursery growers were lack of marketing facility, lack of skilled labour, lack of reasonable price to the product, lack of marketing knowledge and lack of training facility. The mushroom growers reported that lack of marketing facility; storage technique and facility, lack of quality spawn and non availability of skilled persons were the main constraints. The major constraints observed among the beekeepers were lack of marketing availability, obstacle at the time of migration of bee boxes from one place to another, lack of reasonable rate of honey, lack of insurance facility and lack of availability of the bee boxes. The poultry farmers reported that lack of marketing facility was the most important challenge for them. Lack of knowledge, lack of government support, lack of feed at reasonable price, lack of knowledge about important diseases were other constraints faced by the poultry growers. Major obstacles observed in dairy entrepreneurship were lack of knowledge for breed selection, lack of technical information, unreasonably low rate of milk given by the Dairy Cooperatives, high labour cost, no governmental support for financial assistance, no insurance facility provided by any agency, vaccination problem, unavailability of veterinary doctor for caring health of the animals and lack of bank loan.

Further, the majority of the respondents had high level of planning orientation (81.0%), high level of production orientation (69.0%), but medium level of marketing orientation (45.0%).

This study is possibly the first attempt to peep into the challenges of agriculture based entrepreneurs of Bihar State and as such the findings of this study are likely to lead to several political, administrative and strategic implications in future.

**Horticulture (Pomology)**

Name of student	: Priyanka Kumari	Degree	: M.Sc.(Ag) in Horticulture (Pomology)
Father's name	: Sri Deo Narayan Prasad	OGPA	: 8.141
Address	: At-KohiparSonajan, P.o-Dighri, P.s- Surajgradha, Lakhisarai-811106	College Name	: BAC,Sabour
Date of Birth	: 24/02/1990	Mobile NO.	: 8678034485
Category	: BC	Email Id	: PriyankaPiru21@gmail.com
Roll No.	: M/Hort/94/BAC/2013-14	Present Status	: Job in Bank
Name of Advisor	: Dr. Abhay Mankar		

***Thesis Title : Profiling Physico-chemometric Characteristics of Guava with Special Reference to Enzymatic and Non- Enzymatic Antioxidants***

**ABSTRACT**

Guava (*Psidium guajava* L.) is one of the most important commercial fruit crops of India and belongs to the family Myrtaceae. It is originated in Tropical America. Concern about improving health has enhanced research on bioactive antioxidants. Plants have evolved different phytochemicals and enzymes as antioxidant defense to maintain growth and metabolism. The consumption of fruits and vegetables is increasing in both domestic and international markets due to growing recognition of their health promoting potential. Antioxidants retard ageing besides preventing or delaying oxidative damage of lipids, proteins, and nucleic acids caused by reactive oxygen species. Guava, the poor man's apple, is one of the most important commercial fruits of India. A few studies demonstrated that guava fruits have a good amount of bioactive molecules. However, no systematic research has been carried out so far to indentify the antioxidant potential of peel and pulp fractions of guava fruits. Moreover, there is also a need of characterizing available guava cultivars for the development of new varieties with higher nutritional status Considering these facts, an experiment was designed to characterize different guava cultivars with respect to enzymatic and non-enzymatic molecules, antioxidant capacity, elemental composition, and other physicochemical parameters. The experiment was performed in the Deptt. of Horticulture (Fruit & Fruit Tech.) and Deptt. of Food Science and Post Harvest Technology, Bihar Agricultural College, Sabour Bhagalpur, Bihar with 5 varieties of guava namely Allahabad Safeda, Lalit, Kimchu, Salithong, and KG guava. The physico-chemical analyses of all the cultivars revealed a significant variation in fruit weight (~75-354 g), fruit length (~33-73 mm), fruit diameter (~41-86 mm), and fruit shape index (~0.7-1). The biochemical parameters were also found to vary significantly among the studied cultivars. A wide range of ascorbic acid (~124-185 mg/100g FW), T.S.S. (~13-10 %), titratable acidity (0.42-0.77 %), and sugar/acid ratio (~7-13) has been recorded. The analyses



of pigments (mg/ 100 g FW) revealed that except lycopene (~18) in Lalit, contents of Chlorophyll a (~5-12), chlorophyll b (~2-4) and carotenoids (~33-66) varied significantly among the cultivars. The recovery of antioxidant components from plant materials mainly depends upon the amount, nature and the concentration of solvents used in an extraction method. There were two solvents (water and methanol) used for the extraction of bioactive molecules from peel and pulp of the fruit. Significant variations in flavonoid contents (mg catechin/100 g FW) were recorded in peel and pulp of the fruits, which was ranged between 12.84 – 33.92 and 2.55 - 5.58 in lipophilic and 5.06 – 11.49 and 1.60- 4.19 in hydrophilic extracts, respectively. Significant variations in total phenol contents (mg catechol/100 g FW) were recorded in peel and pulp of the fruits, which ranged between 27.1-53.4 and 8 - 13.8 in lipophilic and 15 - 21 and 3.9 - 5.6 in hydrophilic, respectively. Irrespective of the cultivars, tissue fractions, and extraction methods used, the antioxidant potential was also varied significantly. The percent radical scavenging activity recorded in peel and pulp was ranged from 90.25 - 96.12 and 56.89 - 84.40 in lipophilic and 59.47 - 85.84 and 43.46-63.68 in hydrophilic, respectively. The percent metal chelating activity was found to range from 55.24 - 62.28 and 30.49 - 43.41 in lipophilic and 59.47-87.34 and 43.46 - 63.68% in hydrophilic, in peel and pulp, respectively. The value of FRAP (̑mol Trolox/g) assay in both peel and pulp was varied between 5.92 - 6.97 and 5.33 - 6.26 in lipophilic and 5.60 - 6.65 and 4.34 - 5.10 in hydrophilic. The CUPRAC activity (̑mol TroloxE/g) ranged between 12.93 - 20.78 and 3.14 - 4.99 in lipophilic and 6.69 - 12.02 and 1.46-2.79 in hydrophilic of peel and pulp, respectively. Superoxide anion activity ranged between 58.26-59.36 and 51.97-57.45 in lipophilic and 52.80-58.38 and 43.64-50.14% in hydrophilic. The total antioxidant capacity was ranged between 2.35-2.61 and 2.08-2.22 in lipophilic whereas in hydrophilic it was found to vary from 1.48 - 2.10 and 1.39-1.61 in peel and pulp, respectively. Enzymatic analyses also revealed a significant variation in antioxidant enzymes. Superoxide dismutase activity varied between ~54 and 71 U/g fw, whereas APX activity was recorded to vary between ~42 and 59U/g fw. Elemental analyses of different cultivars also revealed significant variation in their contents. The primary nutrients, N, P and K ranged between 1.00-1.70, 0.15-0.12 and 3.28-2.60%, whereas the micronutrients (ppm), Fe, Zn, Mn and Cu were found to vary between 42.25 - 64.23, 12.88 - 16.60, 2.93-8.23, and 2.21to5.67 ppm respectively. In conclusion, significant variations were observed in all the cultivars, irrespective of peel and pulp fractions and extractants used. The cultivar KG guava was identified as the best among the lot, however, the hierarchy was: KG guava > Kimchu > Salithong > Lalit ~ Allahabad Safeda.

**Horticulture (Pomology)**

Name of student : Awadh Kisore Sah Degree : M.Sc.(Ag) in Horticulture (Pomology)  
Father's name : Sri Krishna Sah OGPA : 7.560  
Address : Vill-Teliyan, Po-Nabiganj Bazar, Siwan,-841409 College Name : BAC,Sabour  
Date of Birth : 15/09/1991 Mobile NO. :  
Category : ST Email Id : mps4741@gmail.com  
Roll No. : M/Hort/101/BAC/2013-14 Present Status : Job in Bank  
name of Advisor : Dr. H.Mir

**Thesis Title : *Micropropagation of Strawberry (Fragaria x ananassa Duch.) cv. Ofra***

**ABSTRACT**

The rate of strawberry propagation through conventional technique is quite low and continuous planting of runners from old mother plants for five or more years that are prone to diseases & viruses are the main causes of low productivity of strawberry. Further non availability of quality planting material is limiting its cultivation in the Bihar. There is huge demand for quality planting material of important varieties of strawberry in the state and its runner production is not feasible in this area due to hot climate prevailing during April-June. Keeping in view these factors an experiment was carried out on Micropropagation of strawberry (*Fragaria x ananassa Duch.*) cv. Ofra. One of the most commonly encountered problems in in vitro culture establishment is the contamination. The efficiency of sterilizing agents was evaluated in terms of maximum aseptic explants sprout. When no sterilant was used all the cultures of shoot tip, nodal segment and crown were contaminated. The contamination of shoot tip, nodal segment and crown explants significantly decreased with increase in concentration of sterilants and their time of exposure. The presence of phenolic compounds causing death of explants has been another major problem in micropropagation of strawberry. They appear after tissue

excision and are many times aggravated by growth media constituents. In our experiment all the treatments significantly reduced phenolic exudation from shoot tip, nodal segment and crown explants. Almost no phenolic exudation (+) and maximum percent regeneration was found, when MS medium was supplemented with ascorbic acid (0.2 %) + Citric acid (0.2%). However, the degree of phenolic exudation was higher in control (++++) in all the explants. Addition of cytokinins alone or in combination with auxin was found essential during initiation and establishment of culture. Among the growth regulators tested, BAP 2.0 mg l<sup>-1</sup> + IAA 0.5 mg l<sup>-1</sup> was found most effective with regard to number of days (12.3) required for shoot induction and length of shoots (7.8 cm) where as maximum number of shoots was achieved with BAP 3.0 mg l<sup>-1</sup> + IAA 0.5 mg l<sup>-1</sup>. Half strength MS media with IBA 1.5 mg l<sup>-1</sup> was found significantly higher over all other auxin

treatments for various rooting parameters. Strawberry plantlets obtained through in vitro propagation exhibited 30-70 percent survival during acclimatization in different potting mixtures. Strawberry is still a new crop for Bihar therefore further research needs to be conducted to study all the factors involved in adventitious shoot regeneration, rooting and acclimatization of strawberry in order to optimize protocols for use in genetic transformation.

**Horticulture (Pomology)**

Name of student	: Jyoti Kumari	Degree	: M.Sc.(Ag) in Horticulture (Pomology)
Father's name	: Sri Prithvi Chandra Gupta	OGPA	: 7.803
Address	: VILL-CHIRIYABAD Munger	College Name	: BAC, Sabour
Date of Birth	: 04/03/1989	Mobile NO.	: 9155170814
Category	: OBC	Email Id	: jyotihorticulture@gmail.com
Roll No.	: M/Hort/165/BAC/2014-15	Present Status	: Admitted in Ph.D. Programme at BAC, Sabour
Name of Advisor	Mr. Ravindra Kumar		

***Thesis Title : Effect of foliar spray of certain chemicals on fruit retention, yield and quality of mango (Mangifera indica L.) cv. Langra***

**ABSTRACT**

Mango (*Mangifera indica* L.) is the major fruit crop which comes under anacardiaceae family. It enjoys the status of king of fruits due to its delicacy, attractive appearance, fragrance, nutritive value and luscious taste. Langra is an important commercial mango variety of North India. It is biennial bearer and a mid season variety, with good quality fruits. In mango many problems are associated with fruit set, yield and quality due to imbalance supply of nutrients and it results in poor health of plants, fruit quality, increase in fruit drop and moreover the unhealthy plants are also more prone to attack of insect- pest and diseases. In the present study entitled "Effect of foliar spray of certain chemicals on fruit retention, yield and quality of mango (*Mangifera indica* L.) cv. Langra". An attempt has been made to improve retention, yield and quality of fruits with certain mineral nutrients and bio-regulator. The trial was conducted in 2014-2015. The plants were thirty five years old and growing in the AICRP (Fruits), Bihar Agricultural College, Sabour. The treatments comprised calcium @ 0.06%, boron @ 0.2%, sorbitol 2%, urea 3%, NAA 10 ppm, potassium nitrate @ 2% and including one as control (water spray). The experiment was laid out under randomized block design with four replication. The treatments were applied as aqueous sprays at two different times i.e., first spray of calcium nitrate @ 0.06%, boron @ 0.2% and sorbitol 2%, was done just after completion of 50% of flowers on the inflorescence was bloomed on 20.02.2015 and second spray of urea 3%, NAA 10 ppm, potassium nitrate @ 2% at the time of first fruit set. The results showed remarkable influence of different chemicals on fruit retention, yield and quality characters. In order to get maximum fruit weight (281.54g), numbers of fruits per tree (828.0), higher yield (270.86kg/tree), fruit length (9.35 cm), fruit width (7.18cm), fruit volume (278.98cc) of fruit, foliar spray of calcium nitrate at 0.06% was found to be the best treatment. Spraying of boron at 0.2% improved fruit in terms of minimum fruit drop percentage (93.35%), highest pulp percentage (79.05%), Ascorbic acid content (33.39mg/100gfw), Total sugar (11.49%) and carotenoids

content(8.55mg/100 fw). Significant reduction in acidity (2.37%) of fruits was recorded also with the application of potassium nitrate at 2% and improve quality of fruit in terms of TSS (20.12%) reducing sugar (2.68%).

**Horticulture (Pomology)**

Name of student	: Abha Kumari	Degree	: M.Sc.(Ag) in Horticulture(Pomology)
Father's name	: Sri Hareram Sahu	OGPA	: 8.479
Address	: Post-Singhiya, Madhubani Bihar	College Name	: BAC, Sabour
Date of Birth	: 18/11/1990	Mobile NO.	: 9693895076
Category	: OBC	Email Id	: abha2dbg@gmail.com
Roll No.	: M/HORT/164/BAC/2014-15	Present Status	: Admitted in Ph.D. Programme
Name of Advisor	: Dr. Abhay Mankar		: at BAC, Sabour

**Thesis Title : Analysis of genetic diversity of litchi (*Litchi chinensis* Sonn.) hybrids using morphological and molecular markers**

**ABSTRACT**

Litchi (*Litchi chinensis* Sonn.) is an economically important fruit tree of family Sapindaceae and native to southern China. Evaluation and characterization provide a rapid, reliable and efficient tool of information to exploit genetic variability and to augment the utilization of germplasm, but differentiation of cultivars through morphological features is inefficient and inaccurate. Hence, molecular markers with support of morphological analysis have been allowed to solve the problem of cultivar identification and analysis of genetic diversity. Keeping this information in mind, the present investigation was framed with objectives (i) Characterization of litchi hybrids by using morphological and biochemical analysis. (ii) Genetic Diversity analysis of litchi hybrids using molecular marker. The study was accomplished by using 18 hybrid litchi in horticulture garden, BAC, Sabour, during 2014-15. The morphological analysis revealed that sufficient genetic variability was present among the hybrids which provide ample scope for selection of promising hybrids under study. D2 cluster analysis grouped the eighteen hybrids into 5 clusters. The inter and intra cluster distance between the hybrids under study indicate the existence of higher level of genetic divergence among themselves. The highest inter cluster distance was observed between cluster II (comprising of H-104, H-141(W), H-503) and cluster V (comprising of H-580, H-711), whereas, intra cluster distance in cluster III (comprising of H- 141(E), H-517, H-140, H-573) which suggest that selection of promising hybrids of these clusters may lead to creation of variability. H-515 was concluded as superior hybrid among all hybrids in term of fruit weight (26.27 g), aril weight (18.78 g), fruit length (35.60 mm), fruit diameter (35.21mm), aril percentage (71.20%), aril seed ratio (5.46). Hybrid H-104 was found best in term of TSS (22.000 Brix). Morphological traits are not always good indicators of the genotype. Moreover, there is widespread confusion over the identities of litchi cultivars that have been identified only by their morphological traits. Hence,

Identification through only morphological characters may lead to unreliable determination due to environment influence. So, Genetic fidelity and similarity within hybrid litchi were investigated using SSR (simple sequence repeat) and RAPD (random amplified polymorphic DNA) markers. SSR markers studied reflected no polymorphism whereas Sixteen RAPD, resulting in amplification of 71 reproducible polymorphic fragments products. The percentage of polymorphism for RAPD was 68.93%. Range of similarity coefficient varies from 0.506-0.922. H-104 and H-141(W) appears to be very similar both morphologically and genetically whereas two hybrid litchi (H-524 and H-580) were found to be genetically very distant from the other. However molecular analysis revealed very narrow genetic diversity among the hybrids of litchi which concludes that diversity observed through morphological analysis may be influenced by the environmental factors.

**Horticulture(Pomology)**

Name of student	: Syed Razaul Islam	Degree	: M.Sc.(Ag) in Horticulture (Pomology)
Father's name	: Late Syed Sohail	OGPA	: 8.603
Address	: sahamathussain lane, Barahpura Bhagalpur	College Name	: BAC, Sabour
Date of Birth	: 25/01/1991	Mobile NO.	: 8804617626
Category	: OBC	Email Id	: razaulislam5557@gmail.com
Roll No.	: M/Hort/170/BAC/2014-15	Present Status	: -
Name of Advisor	Dr. Kumari Karuna		

***Thesis Title : Characterization of mango hybrids and their paraents using molecular and morphological analysis***

**ABSTRACT**

Mango (*Mangifera indica* L.) is the most popular fruit crop in India and an important member of the family Anacardiaceae, belongs to genus *Mangifera*. India is leading at the top with mango production of 18.24 million tons with 42.2% of world's total mango production FAO (2013-2014). Evaluation and characterization provide a rapid, reliable and efficient tool to exploit genetic variability and utilization of germplasm. The differentiation of cultivars only through, morphological features is inefficient and inaccurate. Hence, molecular markers with support of morphological analysis have been allowed to solve the problem of cultivar identification and analysis of genetic diversity. Keeping this information in mind, the present investigation was framed with the objectives (a) Characterization of mango hybrids using morphological and biochemical markers (b) Genetic diversity analysis of mango hybrids using molecular marker. The study was accomplished by using 8 mango hybrids and their parents in horticulture garden, BAC, Sabour during 2014-15. The morphological analysis revealed that large genetic diversity was present among the hybrids and between the hybrids and their parents which provide scope for selection of promising hybrids under study. On the basis of fruit character among the hybrids of mango, hybrid H-60(l) gives better result in fruit weight, fruit width and fruit volume but among the parents Fazli gives better result. On the basis of fruit quality Hybrid -60(l) gives better result in terms of TSS and acidity among the hybrids while Amrapali gives better result among the parents. Amrapali also having highest chlorophyll a and b contents in their leaves. But morphological traits are not always good indicators of the genotypes since they depend on environmental factors. Hence identification through morphological characters may lead to unreliable determination due environment influence. So, genetic diversity and similarity were investigated using RAPD (random amplified polymorphic DNA) marker. 12 RAPD, resulting in 61 reprodu-cible polymorphic fragments products. The percentage of polymorphism for RAPD



was 83.60%. The range of similarity coefficient varies from 0.300-0.823. Hybrid -140 and Sabri appears to be very similar. Kalapady and Fazli were found to be genetically very distant from the other. However molecular analysis revealed very broad genetic diversity among the hybrids and between the hybrid and their parents in mango.

**Horticulture(Pomology)**

**Name of student** : Amit Raj Degree : M.Sc.(Ag) in Horticulture (Pomology)  
**Father's name** : Sri Rajeshwar Das OGPA : 7.781  
**Address** : Panchseel colony near Nehru College Name : BAC, Sabour  
yuva Kendra, Anderkila Mobile NO. : 9473378282  
Hazipur Dist-Vaishali, -844101 Email Id : amithortraj@rediffmail.com  
**Date of Birth** : 05/01/1986 Category : SC  
**Roll No.** : M/Hort/04/BAC/2011-12 Present Status : Job in BAU, Sabour  
**Name of Advisor** : Prof. V. B. Patel

***Thesis Title : Effect of high density planting systems on growth, fruit yield and quality of mango (Mangifera indica L.) cv. Amrapali after rejuvenatio***

**ABSTRACT**

Mango trees grown under high density planting show a progressive decline in fruit yield after 12-13 years of planting, due to overcrowding of branches and poor light interception by the tree canopies and results in poor utilization of available resources and ultimately low productivity and profitability. So to optimize the wastage of resources, to increase the productivity per unit area, an experiment on rejuvenation was conducted in old and overcrowded Amrapali mango orchard at Bihar Agricultural College, Sabour with two objectives. i. To find out the effect of high density planting systems on growth, physiological and biochemical parameters of Amrapali mango trees after rejuvenation and ii. To study the effect of High density planting systems on fruit yield and quality of Amrapali mango after rejuvenation. For this purpose, five planting systems, viz. (i) Square system (1600 plants/ha) (ii) Hedge row system (2670 plants/ha) (iii) Double hedgerow system (3556 plants/ha) (iv) Paired planting (2133 plants/ha) and (V) Cluster planting (2844 plants/ha) planted in 1992 and rejuvenated in 2009 were chosen for study. The result obtained clearly reveals that rejuvenation of mango planted under high density planting systems had significant effect on growth and physiology of plants including yield and quality. Square planting system received maximum (6.92klux) light penetrance within the canopy which resulted in maximum chlorophyll and iron content which together created a congenial environment for the growth of healthy shoot and large canopy volume. Leaf relative water content (87.63%) was found maximum in square planting system because of minimum leaf area found in square planting which reduced the transpiration rate resulted into maximum leaf relative water content. Hedge row planting systems recorded maximum rate of photosynthesis (8.36,  $\mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$ ), leaf area index (1.69), total carotenoids (18.88 mg/100g), and manganese content (326.97 ppm). They together played an important role in photosynthesis and carbohydrate metabolism by converting

light energy into chemical energy resulting in increased carbohydrate storage which is seen in form maximum width, volume and weight of fruit in this planting system. Double hedge row planting system reported maximum increase in height of the plant, longer full bloom period and increased stomatal conductance ( $0.171 \text{ mol m}^{-1} \text{ m}^{-2} \text{ s}^{-1}$ ) with high canopy relative humidity (67.11%). Acidity and reducing sugar also found maximum in this planting system. Paired planting system had maximum total phenol content (53.09 mg/g) which restricted the vigourness of plant which resulted in minimum canopy volume and maximum canopy temperature of the plant, save energy for fruitfulness of plant which resulted in increase zinc (73.49 ppm), copper (24.73 ppm) and internal carbon concentration (245.38 ppm), resulting in to maximum number of fruits per tree (38.47), maximum yield (8.21 kg/tree), highest TSS and total sugar. Maximum malformed shoots (36.10%) were also found in paired planting because light penetrance (4.80 Klux) was very low in north-south direction of the treatment. The longest fruit size was found in paired planting it might be due to maximum canopy temperature (38.12°C) recorded in the treatment. Transpiration rate was found maximum in cluster planting and minimum in square planting because of maximum leaf area (156 cm<sup>2</sup>) of cluster planting and minimum leaf area (137.32 cm<sup>2</sup>) in square planting. Pruning lead to high accumulation of nutrient in this treatment which is proved by nutrient analysis of leaf which show maximum N.P.K (%) content in cluster planting. High density planting and pruning had non-significant effect on T.S.S (0 Brix). Acidity (%) and reducing sugar (%). Increasing planting density did not change significantly most variables related to fruit quality, such as fruit weight, pulp weight, fruit length, dorsal fruit diameter, soluble solids. Therefore in present study, high density had little influence on fruit quality, but as far as T.S.S: Acid ratio, total sugar and carotenoids are concerned present study exert significant effect by the treatment. Fruits from tree in narrow spacing show higher value of sugars and carotene. From the results and discussion made so far, it can be inferred that rejuvenation in high density of Amrapali can improve the growth, yield, and quality of plants by modifying the canopy architecture and canopy microclimate. In fact it is early to say which planting system was best but over all best performance was shown by paired planting system followed by cluster planting. But further observation is needed to come on solid conclusion for best planting system because this observation was of only first year of fruiting.

**Horticulture (Pomology)**

Name of student :	Ravi Kumar	Degree :	M.Sc.(Ag) in Horticulture (Pomology)
Father's name :	Sri Bageshwar Prasad	OGPA :	7.675
Address :	Dumwaliya(dih), P.o-Naraipur, P.s-Bagha, Dist-West Champaran	College Name :	BAC,Sabour
Date of Birth :	15/04/1982	Mobile NO. :	9931684112
Category :	BC	Email Id :	skh226@gmail.com
Roll No. :	M/Hort/30/BAC/2011-12	Present Status :	Job in BAU, Sabour
Name of Advisor :	Prof. M.Feza Ahmad		

***Thesis Title : Rapid multiplication of banana cv. 'Grand Naine' through tissue culture***

**ABSTRACT**

Banana is generally propagated vegetatively through suckers, which grow from lateral buds originating from corms and suckers. Suckers are used for production of individual plants. In some instances, complete or separated corms with one or several buds may be used. This process is very slow as the rate of multiplication of suckers through conventional vegetative means has been found to express several negative impacts which include transmission of diseases, low production and poor preservation of original plant genetic material. Further one banana plant produces only five to ten suckers in a year depending upon the variety and grow more slowly and produce smaller bunches. Quality planting material is the key for successful production of banana and tissue culture is an excellent option for producing low cost quality planting material. The rapid proliferation obtained in tissue culture allows nurserymen to meet an unexpected demand for a particular variety. Keeping in view the importance of tissue culture technology in banana an experiment was carried out on "Rapid multiplication of banana cv. 'Grand Naine' through tissue culture". One of the most commonly encountered problems in in vitro culture establishment is the contamination. The efficiency of sterilizing agents was evaluated in terms of maximum aseptic explants sprout. The contamination significantly decreased with increase in concentration of sterilants and their time of exposure. MS media supplemented with 2,4-D 2.0 mg/l + NAA 0.1 mg/l was found most effective for callus formation. Addition of cytokinin alone or in combination with auxins was found essential during shoot proliferation and multiplication. BAP 3.0 mg l<sup>-1</sup> + NAA 1.0 mg l<sup>-1</sup> was found most effective with regard to number of days (22.2) required for shoot induction and length of shoots (7.0 cm) where as maximum number of shoots (4.8) was achieved with BAP 4.0 mg l<sup>-1</sup> + IAA 0.1 mg l<sup>-1</sup>. Half strength MS media with IBA 1.5 mg l<sup>-1</sup> was found significantly higher over all other auxin treatments for various rooting parameters. Grand Naine plantlets obtained through in vitro propagation exhibited highest 80 percent survival in coco peat during acclimatization.

**Horticulture(Pomology)**

Name of student	: Kiran Bharati	Degree	: M.Sc.(Ag) in Horticulture (Pomology)
Father's name	: Sri Ram Kripal Mahto	OGPA	: 7.951
Address	: VILL-Bardahi, PO- Bardaha	College Name	: BAC, Sabour
Date of Birth	: 11/01/1990	Mobile NO.	: 8002269201
Category	: OBC	Email Id	: iran.bharati16@gmail.com
Roll No.	: M/Hort/169/BAC/2014-15	Present Status	: Job in Bank
Name of Advisor	Dr. Muneshwar Prasad		

***Thesis Title : Micro-propagation of banana cv. Malbhog for production of quality planting material***

**ABSTRACT**

Banana belongs to the genus *Musa* and family *Musaceae*. It is one of the most important source of tropical fruits in the world market because it is a significant staple food as well as a major export commodity. Banana is the second major fruit crop after mango in Bihar. Two distinct tracts growing banana in Bihar are Vaishali region and North Eastern Koshi region. Important varieties grown in Bihar are Alpan, Malbhog, Kanthali, Champa, Kothia, Chinia and Chini Champa. Many of these varieties such as Malbhog and Alpan have no match for their fruit quality. These excellent varieties are on verge of extinction due to problem of diseases and non-availability of quality propagules. The conventional method of vegetative propagation in banana is by means of daughter sucker. However, the constraints of conventional propagation is the variation in age and size of sucker, non-uniform crop, prolonged harvesting difficulty in management and lack of availability of large quantities of sword suckers at any given time. In vitro propagation of bananas provide excellent advantages over traditional propagation, including a high multiplication rate, physiological uniformity, the availability of disease-free material all the year round, etc. Therefore, present study was performed with the objective to establish aseptic shoot culture of banana cv. Malbhog and hardening of rooted plantlets for field transfer using different (alone or in combination) sterilants, PGRs and potting mixtures. One of the most commonly encountered problems in in vitro culture establishment is the contamination. The efficiency of sterilizing agents was evaluated in terms of maximum aseptic explants sprout. Maximum aseptic shoot culture establishment (45.00) was obtained by surface sterilizing the explants with ethanol (70%) for 30 sec + HgCl<sub>2</sub> (0.1%) for 25 minutes. Addition of cytokinins alone or in combination with auxin was found essential for shoot initiation and multiplication. Minimum no. of days for shoot initiation (18.4 days), longest length of shoot (5.1 cm) and maximum no. of shoot/ explant (4.20) was obtained on PGR combination NAA 0.5 + BAP 5.0 mg/l. Half strength MS media with IBA 1.5 mg/l was found significantly higher over all other auxin treatments for various rooting parameters. ½ MS media supplemented with 1.5 mg/l IBA gave best response in terms of root formation frequency (66.67%), least no. of

days for root formation (18.00), maximum no. of roots/explant (3.80) and longest length of root (4.0 cm). Maximum survival for hardening of plantlets was found in case of coco peat (89%) followed by sterile soilrite (79%). For various morphological parameters like plant height, leaf length, leaf width, leaf number, etc. coco peat gave better result over other. Thus, an attempt was made to standardize efficient and rapid micropropagation protocol which will be useful in expanding area under cultivation of Malbhog banana.

**Horticulture (Olericulture)**

Name of student	: Aakanksha	Degree	: M.Sc.(Ag) in Horticulture (Olericulture)
Father's name	: Sri Prem Chand Pd. Singh	OGPA	: 8.070
Address	: DhautalMahtoTola (Tikarampur) P.O-Tikarampur 811201 Munger, Bihar	College Name	: BAC, Sabour
		Mobile NO.	: 9430423715
		Email Id	: aakankshasingh04@gmail.com
Date of Birth	: 23/10/1990	Category	: OBC
Roll No.	: M/HORT/116/BAC/2013-14	Present Status	: Admitted in Ph.D. Programme at BAC, Sabour
Name of Advisor	Dr. Shirin Akhtar		

**Thesis Title : Stability Analysis in Brinjal (*Solanum Melongena L*)****ABSTRACT**

Brinjal or eggplant or aubergine (*Solanum melongena L.*) is an often- cross pollinated crop which belongs to family Solanaceae having chromosome no.  $2n=24$ . The area, production and productivity of brinjal in India is 0.72 million hectares, 13.55 million tonnes and 19.1 t/ha respectively and that of Bihar is 0.057 million hectares, 1.24 million tonnes and 21.6 t/ha respectively. Brinjal is a warm season crop and susceptible to severe frost. A long and warm growing season is desirable for successful brinjal production. Optimum mean temperature of 18 to 25 °C is most favourable for better growth and yield while that for seed germination is 25 °C. Brinjal is a day neutral crop, but its performance throughout the year and in different years may vary. Hence stable genotypes are the need of the hour. Hence this investigation was framed with the objectives to study the phenotypic stability of yield and its attributing traits, to study inter-relationships of different characters having direct and indirect effects on yield and to identify genotype(s) having better performance throughout the year. Twenty genotypes were grown in three environments, viz. autumn-winter, summer-rainy and early autumn-winter in RBD with three replications. There was significant variation in the genotypes under study as well as the environments, as indicated by analysis of variance. Different genotypes of brinjal grown at different seasons showed significant variability due to G x E interactions for most of the characters. G x E interaction were significant for plant height, fruit length, fruit diameter, fruit size, number of fruit per plant and fruit weight indicating that linear as well as non-linear components were important. Thus association studies were performed. There was significant positive correlation between days to first and 50% flowering, and number of fruits per plant with yield/plant while significant negative correlation between plant height and yield. Average fruit weight and fruit girth were negatively correlated with number of fruits per plant. Plant height and plant spread were both positively correlated with average fruit weight while negatively correlated with number of fruits per plant. Number of primary branches per plant, days to 50% flowering, fruit length, fruit girth, number of fruits per plant exerted high

direct effect on plant. Number of fruits per plant exerted high indirect effect via plant height, plant spread, number of primary branches, days to 50% flowering and average fruit weight. Fruit girth had high indirect effect via plant height, plant spread, days to first and 50% flowering, fruit length, number of fruits per plant and average fruit weight. Hence selection pressure should be exerted on these traits. Based on these the ideotype for brinjal should have low plant height, spread and primary branch number, moderate fruit length, girth and average weight and high fruit number to get high yielding plant. The stable genotypes for different traits were IIHR 562, Rajendra Baingan-2 for plant height, Arka Neelkanth, PPC, IC 261802 for plant spread, Swarna Mani, BRBR-01 for number of primary branches/plant, Muktakeshi, IC 89933, IC 89837 for days to first flowering, Muktakeshi, Swarna Mani, Brinjal 71-19 for days to 50% flowering, IC 261802, BRBR-01 days to first harvest, BRBL-04, Punjab Brinjal-67, PPC for fruit length, BRBL-01, IC 89933, IC 261802 for fruit girth, BRBL-01, Pant Rituraj for number of fruits/plant, BRBL-01, BRBL-04, Punjab Brinjal-67 for yield/plant and BRBL-01, BRBL-04, Punjab Brinjal-67 for total yield. The most promising stable genotypes identified from this investigation were BRBL-01, BRBL-04 and Punjab Brinjal-67.



**Horticulture (Olericulture)**

Name of student	: Reena Kumari	Degree	: M.Sc.(Ag) in Horticulture (Olericulture)
Father's name	: Sri Jagdish Sinha	OGPA	: 7.398
Address	: Bain, Nalanda, Bihar	College	: BAC, Sabour
Date of Birth	: 26/01/1985	Mobile NO.	: 8539915110
Category	: BC-2	Email Id	: sinharee123@gkmail.com
Roll No.	: M/Hort/160/BAC/2014-15	Present Status	: In Service
Name of Advisor	: Dr. Sangeeta Shree		

***Thesis Title : Response of okra cv. Kashi Kranti to plant growth regulators and micronutrients***

**ABSTRACT**

Okra [*Abelmoschus esculentus* (L.)] is an important vegetable crop grown throughout the tropical and sub-tropical regions and is especially valued for its tender and delicious fruits in different parts of the country and are generally marketed in the fresh state, but sometimes also in canned or dehydrated forms. India is the largest producer of okra in the world. In India okra is cultivated in an area of 0.5 m ha and has production of 5.7 mt while in Bihar okra occupies an area of 0.057 m ha and production of 0.762 mt. Okra has a tremendous export potential as fresh vegetables and accounts for about 60 per cent exchange from export of vegetables. Fruit quality plays an important role in okra productivity and marketability. Its fruit are rich in vitamin A, vitamin C, calcium, potassium and other minerals. Although PGR and micronutrients have great potential for growth improvement but their application has to be planned sensibly in terms of optimal concentration and stage of application. Therefore, the present study was planned with the objectives to study the effect of PGR and micronutrients on growth, yield and quality of okra fruits and seed and also to work out the benefit cost ratio involved. Keeping the above fact in view the present investigation was framed with two levels of PGRs of GA3(100 ppm,150 ppm), NAA(100 ppm and 150 ppm) along with three levels of micronutrients ZnSO<sub>4</sub> (20kg, 30kg and 40 kg), borax(5 kg,10 kg,15 kg) and along with control having 35 treatment combination. The experiment was laid out in RBD (factorial) and replicated thrice having plot size of 3.00 m x 2.5 m with the spacing of 50 cm x50 cm. The research work was laid out at vegetable seed production area BAU, Sabour, Bhagalpur during Kharif season 2015. Significant effect due the interaction of PGRs and micronutrients was found on number of leaves (25.85), number of branches (4.5), plant height (112.44 cm), number of fruit (27.98), fruit fresh weight (20.65g) and fruit yield (148.56q/ha), seed yield (77.48 g), chlorophyll-a (2.60), zinc content (38 ppm), boron (46 ppm), copper (25 ppm) and germination (92%) while days taken to first flowering showed non-significant effect. Combined effect of GA3-100 ppm and borax-15 kg i.e. G3M6 gave outstanding result, being significantly superior to all the treatment combinations. The maximum net return (Rs.168959.20/ha) with higher benefit cost ratio (3.14) was also obtained under the treatment, GA3100 ppm and borax-15 kg i.e.G3M6. The treatment combination of G3M2 ranked second in merit in respect of net return and B:C ratio.

**Horticulture(Olericulture)**

Name of student	: Ashish Kumar Singh	Degree	: M.Sc.(Ag) Horticulture (Olericulture)
Father's name	: Sri Om Prakash Singh	OGPA	: 7.726
Address	: Vill - Khalasapatti Khuthan Jaunpu	College Name	: BAC, Sabour
Date of Birth	: 15/08/1991	Mobile NO.	: 7050448262
Category	: GENERAL	Email Id	: ashish.horti1991@gmail.com
Roll No.	: M/Hort/153/BAC/2014-15	Present Status	: Admitted in Ph.D.
Name of Advisor	: Dr. S. S. Solankey		Programme at BAC, Sabour

***Thesis Title : Heterosis breeding in tomato for yield and quality*****ABSTRACT**

Tomato (*Solanum lycopersicum* L.) belongs to the family Solanaceae and is the fourth most economically important crop in the world: after rice, wheat, and soybean. Hybrids are important due to high yield and uniformity and breeders are in look out for new hybrids. Heterosis and specific combining ability are good source for better hybrid selection while the general combining ability for the selecting to better combiner parent useful in breeding proposes. A half diallel mating scheme was adopted to develop 21 hybrids in autumn-winter season of 2014-15 and the hybrids along with the seven parents and two checks were evaluated in RCBD with three replications in the autumn-winter season of 2015-16 to accomplish the objectives: to estimate the extent of genetic variability, heritability and genetic advance, to estimate the extent of heterosis and combining ability for yield and quality contributing traits and to study the association of different characters and their direct and indirect effect with fruit yield and quality components. On the basis of mean performance the earliest flowering was observed in Pusa Rohini × CLNB and highest fruit yield was found in Arka Alok × CLNB followed by H-86 × Arka Alok and H-86 × Sel-12. Among all hybrids highest TSS (°brix) was observed in Pusa Rohini × Sel-12 and Lycopene Content (mg/100g FW) in Pusa Rohini × Arka Alok. High broad sense eritability was observed for all characters. However, high genetic advance in % of mean was found in all characters except days to first flowering, days to 50% flowering, days to first fruit setting and TSS (°brix). Arka Alok × CLNB possessed high significant BPH (38.45%) and SH (22.94%) in the desirable direction for total fruit yield, while Pusa Rohini × Sel-12 possessed high significant standard heterosis for total soluble solid, ascorbic acid, phenol content, antioxidant and lycopene respectively. On GCA basis H-86 is better for fruit yield per plant and total fruit yield and Sel-12 for earliness as well as Sel-12 and Pusa Rohini for most of the biochemical parameters. On SCA basis Arka Alok × CLNB is best for fruit yield and Pusa Rohini × CLNR is best for biochemical parameters. The characters which are positively significant association with fruit yield are average fruit weight, primary branches per plant, fruit size, titrable acidity and ascorbic acid content however fruit yield is negatively significant associate with TSS. TSS shows positive significant association with all the traits except titrable acidity. Number of fruits per plant, average fruit weigh and equatorial fruit diameter

are major direct positive contributing traits for higher yield in tomato. All biochemical characters have negative direct effect except TSS and Lycopene content. On the basis of findings the genotypes viz., H-86, Sel-12 and Pusa Rohini have better general combining ability moreover, the crosses viz., Pusa Rohini × CLNB, Arka Alok × CLNB, Pusa Rohini × Sel-12 and Pusa Rohini × CLNR are better performing hybrids for yield and quality contributing traits and can be used in tomato improvement programme for high yield and quality.

**Horticulture(Olericulture)**

**Name of student** : Bahadur Singh Bamaniya      Degree : M.Sc.(Ag) in Horticulture (Olericulture)

Father's name : Sri Radhe Shyam Bamaniya      OGPA : 7.689

Address : Vill- Nipaniya Sikka Sehore      College Name : BAC, Sabour

Date of Birth : 03/08/1991      Mobile NO. : 8989439219

Category : SC      Email Id : bamaniyabahadur@gmail.com

Roll No. : M/Hort/152/BAC/2014-15      Present Status : -

Name of Advisor : Dr. SangeetaShree

**Thesis Title : Morphological and molecular characterization of garlic (*Allium sativum* L.)**

**ABSTRACT**

Garlic (*Allium sativum* L.) is considered as one of the most important species in onion family, Amaryllidaceae. It has its origin in central Asia and Southern Europe especially the Mediterranean region. Garlic reproduces vegetatively under the local conditions. Traits like bulb weight, number of cloves per bulb and clove weight may be used as criteria of selection, for improving agronomical characters of garlic in breeding programme. Evaluation and characterization provide a rapid, reliable and efficient tool of information to exploit genetic variability and to augment the utilization of germplasm. Tremendous morphological variability was found for characters such as yield, number of cloves, color of bulb, size of clove, and size of leaves in most of the biotypes. SSR markers have become one of the most preferred marker systems because they are typically co-dominant, reproducible, cross-species transferable and highly polymorphic. This study was aimed to develop new SSR markers from the garlic EST sequences and to validate the utility of these markers by evaluating genetic relationships between diverse garlic clones. Keeping these information's in mind, the present investigation was framed with objectives (i) To characterize diverse genotypes on morphological and molecular basis (ii) To study the variability in the existing genotypes. (iii) To establish inter relationship among various attributes under study. The study was accomplished by using 27 garlic genotypes laid out in RBD in three replications in vegetable research farm, BAC, Sabour, during rabi season of 2014-15. The finding revealed that sufficient genetic variability was present among the genotypes which provide ample scope for selection of promising genotypes under study. Genotype 644 was the highest yielder (26.19 g). High values of genotypic and phenotypic coefficients of variation (PCV & GCV) were recorded for weight of clove (22.88 & 20.73), yield per plant (21.37 & 20.34) and cloves per bulb (18.94 & 17.89). All morphological characters were positively correlated with yield/plant. D2 cluster analysis grouped the 27 genotypes into 6 clusters and most diverse genotype was found to be 644. Using 10 primers, a total of 31 alleles were obtained. The PIC values ranged from 0.145 to 0.415 with an average of 0.019. On the basis of PIC value obtained in this study, the further use of Asa 14 (0.403) and Asa 16 (0.415) SSR markers for genetic diversity analysis in garlic might be advocated.

**Horticulture(Olericulture)**

Name of student	: Meenakshi Kumari	Degree	: M.Sc.(Ag)Horticulture (Olericulture)
Father's name	: Sri Shashi Bhushan Singh	OGPA	: 8.762
Address	: Ganyari Postsakra Muzaffarpur	College Name	: BAC, Sabour
Date of Birth	: 10/09/1992	Mobile NO.	: 7050447980
Category	: Gen	Email Id	: meenakshisinghupcs@gmail.com
Roll No.	: M/Hort/154/BAC/2014-15	Present Status	: Pursue Ph.D at CSAUA&T, Kanpur
Name of Advisor	Dr. S.S.Solanki		

***Thesis Title : Morpho-biochemical characterization in brinjal*****ABSTRACT**

Brinjal, eggplant or aubergine (*Solanum melongena* L.) being a native to India has great variability existing in the country. It is a rich source of nutrients particularly, carbohydrates, proteins, dietary fibre and vitamins like thiamin, niacin, pantothenic acid and folic acid as well as minerals like calcium, iron, potassium, zinc, copper and manganese. Therefore, it can play a vital role in achieving the nutritional security. The subjectiveness of quality introduces great deal of complications in its genetic improvement. Therefore, quality is often a secondary priority in the breeding program. Knowledge of existing variability both at phenotypic and genotypic levels, in the breeding material, for yield and yield attributing traits with good quality is a basic prerequisite for any breeding approach to be exploited for crop improvement. Keeping the above facts in view, the present investigation was framed with the objectives (i) to characterize diverse brinjal genotypes on the basis of morphological parameters, (ii) to characterize diverse brinjal genotypes on the basis of bioactive compounds present in them and (iii) to study the inter-relationship between yield and quality attributing characters. Thirty one diverse brinjal genotypes were grown in RBD at the Vegetable Research Farm, BAC, Sabour during autumn-winter season of 2014-15 and morphological and biochemical studies were performed to accomplish these objectives. The findings revealed that sufficient genetic variability was present among the genotypes which provide ample scope for selection of promising genotypes under study. IC-90087 was the earliest to fruit (48 DAT) while Swarna Mani was the last (73.33 DAT). BRBL-1 was the highest yielder (2.58 kg/plant) with highest number of fruits per plant (31.39). BRBL-8 was the superior genotype in terms of total sugar (4.17%) and total chlorophyll content (2.35 mg/100g FW), while maximum anthocyanin was found in Muktakeshi (28.86 mg/100g FW). Total phenolics content were highest in Arka Neelkanth (12.03 mg/100g FW), while radical scavenging activity (RSA) was maximum in EC-169084 (40.34%). All the morphological as well as biochemical characters except days to first harvest and days to 50% flowering possessed high heritability. All the biochemical characters exhibited high heritability and high genetic advance. Therefore, selection will be more effective for these characters since they are highly heritable and easily fixable due to additive gene effect. D2 cluster analysis grouped the thirty genotypes into 6 clusters. The inter and intra cluster distance between the genotypes under study indicate the existence of higher level of genetic divergence among themselves. The highest inter and intra cluster distance was observed

between cluster II (comprising of IC-90087, BSB-31, IC-107769, EC-354689, VR-2) and cluster III (comprising of IBH-2, IC-215020, BRBL-8, BRBL-1) which suggest that hybridization between the members of these clusters may lead to creation of higher variability and heterosis. Total anthocyanin content had maximum contribution towards genetic divergence (43%), followed by chlorophyll a (31%), radical scavenging activity (9%), fruit weight (5%), total antioxidant capacity (3%) and total phenolics content (3%). Yield per plant showed significant positive correlation with fruit length and number of fruits per plant. So selection for these two characters can be rewarding for yield improvement in brinjal. Fruit weight and number of fruits per plant possessed high direct effect and hence direct selection for these characters can be rewarding for yield improvement. Total antioxidants exerted highly significant positive correlation with total phenols, RSA and total chlorophyll. So selection for these traits can lead to quality improvement, particularly for health benefits. Therefore, the superior genotypes identified may be used in future breeding programme for improvement of yield and especially quality.

**Horticulture(Olericulture)**

Name of student	: Nisha Rani	Degree	: M.Sc.(Ag) in Horticulture (Olericulture)
Father's name	: Sri Baidya Nath Sinha	OGPA	: 8.545
Address	: C/20, A.G.COLONY, ASHIANA NAGAR, PATNA	College Name	: BAC, Sabour
Date of Birth	: 02/09/1989	Mobile NO.	: 9430247692
Category	: OBC	Email Id	: nrani033@gmail.com
Name of Advisor	: Dr. Shirin Akhtar	Roll No.	: M/Hort/159/BAC/2014-15
		Present Status:	Pursue Ph.D. at BAC, Sabour

***Thesis Title : Biophysical and biochemical basis of shoot and fruit borer tolerance in brinjal***

**ABSTRACT**

Brinjal or eggplant or aubergine, *Solanum melongena* L. is one of the most important vegetable crops grown in India and other parts of the world. It is highly cosmopolitan and popular vegetable grown as poor man's crop in India. Brinjal, being a native to India has great variability existing in the country. However, it is highly infested by shoot and fruit borer, *Leucinodes orbonalis* Guen., an obnoxious pest causing fruit damage upto 92.5 percent. The pest is very active during the summer and rainy season and often causes more than 90% damage. Pesticide application is not the only solution of managing the pest as repeated use of pesticide leads to health hazards, destruction of beneficial insects, pest resurgence and environmental pollution. Thus, in order to develop varieties resistant to this pest we need to know the biophysical and biochemical traits that often result intolerance mechanism. Thirty six diverse brinjal genotypes were grown in RBD with three replications at the Vegetable Research Farm, BAC, Sabour during spring-summer season of 2015-16 and morphological and biochemical studies were performed to accomplish these objectives. The findings revealed that sufficient genetic variability was present among the genotypes which provide ample scope for selection of promising genotypes under study. Shoot borer infestation was least in Pusa Purple Cluster (3.28%) followed by BRBR-01 while fruit borer infestation percentage by both number and weight was least in BRBL-01. Pusa Purple Long was the highest yielder (1100.02 g/plant) followed by BRBL-01 (1046.38 g/plant). The morphological characters such as average fruit weight, fruit/plant, yield/plant, shoot borer infestation and fruit borer infestation percentage by number possessed high heritability coupled with high genetic advance. All the biochemical characters

except leaf chlorophyll and ascorbic acid exhibited high heritability coupled with high genetic advance. Therefore, selection will be more effective for these characters since they are highly

heritable and easily fixable due to additive gene effect. D2 cluster analysis grouped the thirty genotypes into 7 clusters. The inter and intra cluster distance between the genotypes under study indicate the existence of higher level of genetic divergence among them. The highest inter cluster distance was observed between cluster III (comprising of BRBL-01) and cluster IV (comprising of BRBL-06, IC 215020, EC 382524, IC 545920, BRBL-07, IC 90148, EC 384606) and intra cluster distance was observed within cluster IV which suggest that hybridization between the members of these clusters may lead to creation of higher variability and heterosis. Total fruit anthocyanin had maximum contribution towards genetic divergence (27%), followed by fruit borer infestation percentage by weight (21%), fruit borer infestation percentage by number (18%), polyphenol oxidase activity (15%), leaf anthocyanin (8%), yield/plant (6%) and number of fruits/plant (4%). Trichome density showed highly significant negative correlation with shoot infestation also days to first flowering and 50 percent flowering exhibited significant negative correlation with shoot infestation and fruit infestation by weight. Days to first flowering and fruit length showed significant and positive correlation with fruit yield/plant. So selection for these two characters can be rewarding for yield and quality improvement in brinjal. Fruit weight and trichome density possessed high direct effect and hence direct selection for these characters can be rewarding for yield and pest resistance improvement. Total phenol content of fruit exerted highly significant and negative correlation with fruit borer infestation by weight and fruit borer infestation percentage by number. So selection for these traits can lead to quality improvement, particularly for pest resistance. The genotypes BRBL-01, Pusa Purple Long, Pusa Purple Cluster and BRBL-04 have been found to be high yielders as well as possessing moderate resistance towards fruit and shoot borer besides having good biochemical properties that may be effective in imparting the resistant trait in the genotypes. Therefore, these superior genotypes may be used in future breeding programme for improvement of yield and especially quality.



**Horticulture (Olericulture)**

Name of student	: Preeti Kumari	Degree	: M.Sc.(Ag)Horticulture in (Olericulture)
Father's name	: Sri Wakil Mandal	OGPA	: 8.412
Address	: At-Patel nagar, Madhopur	College Name	: BAC, Sabour
Date of Birth	: 12/12/1990	Mobile NO.	: 8651349444
Category	: OBC	Email Id	: aakrityprity@gmail.com
Roll No.	: M/Hort/156/BAC/2014-15	Present Status	:
Name of Advisor	Dr. R. B. Verma		

***Thesis Title : Genetic analysis for bioactive molecules and antioxidant activity in bitter gourd***

**ABSTRACT**

Bitter gourd (*Momordica charantia* L.) is an economically important and nutritious vegetable of cucurbitaceous family that is cultivated in India, China, Malaysia, Africa and South America. Bitter gourd possesses comparatively high concentration of ascorbic acid and iron as compared to other cucurbits (Behera et al., 2013). Fruits of bitter gourd also have anti-oxidant, anti-microbial and other health promoting substances such as Chitinase (Yeh et al., 2003). In India, bitter gourd has relatively broad phenotypic and genotypic variations (Brave et al., 2003). Genetic diversity analysis on morphological and biochemical basis is the pre-requisite to know the diversity and similarity among genotypes. Keeping this information in mind, the present investigation was framed with objectives (i) to assess the genetic variation in bitter gourd for morphological parameters and bioactive molecules (ii) to verify the antioxidant potential using different in-vitro assays (iii) to study the inter-relationship between different morpho-biochemical parameters and their effect on yield. The study was accomplished by using 16 diverse bitter gourd genotypes laid out in RBD in three replications at vegetable research farm, BAC, Sabour during Kharif season of 2015. Maximum fruit length was reported in Narendra Baramasi (22.7cm) while Gangajali Small was found least infested by fruit fly, Green Star Bold was found with maximum ascorbic acid content (101.28mg/100g FW), flavonoid (74.74mg GAE/100g) and total phenolic content (345.77mg GAE/100g). High heritability and high genetic advance were reported for fruit yield per plant, average fruit weight, ascorbic acid, total phenolic content, flavonoid content, metal chelating activity and antioxidant capacity by CUPRAC & FRAP assay under study.

**Horticulture(Olericulture)**

Name of student	: Suraj Rathod	Degree	: M.Sc.(Ag) in Horticulture (Olericulture)
Father's name	: Sri Hanumantha Rathod	OGPA	: 8.440
Address	: HNo: MIG-73, APHB Colony Jadcherla, Mahabubnagar, Telangana Mahbubnagar	College Name	: BAC, Sabour Mobile NO. : 7050447982 Email Id : roshanrathodhorti@gmail.com
Date of Birth	: 25/03/1989	Category	: ST
Roll No.	: M/Hort/155/BAC/2014-15	Present Status	: Admitted in Ph.D. Programme at BAC, Sabour
Name of Advisor	: Dr.ShirinAkhtar		

***Thesis Title : Heterosis breeding in brinjal for yield and quality*****ABSTRACT**

Brinjal or eggplant or aubergine, Solanum melongena L. is one of the most important vegetable crops grown in India and other parts of the world. It is highly cosmopolitan and popular vegetable grown as poor man's crop in India. Now-a-days, F1 hybrids are getting popularity in brinjal. It is imperative to obtain such hybrids possessing excellent quality coupled with high yields. Hybridization is the most potential technique for breaking yield barriers and evolving varieties having high yielding potential. In a systematic breeding programme, it is essential to identify superior parents for hybridization and crosses to expand the genetic variability for selection of superior genotypes. A knowledge of general combining ability (gca) and specific combining ability (sca) helps in choice of suitable parents or hybrids and the nature of gene action acts as a basis for choosing an effective breeding methodology. Determination of the yield components through correlation and path coefficient analyses improves the efficiency of breeding programmes. Further, improvement in yield through yield contributing traits depends on the nature and magnitude of heritable variation. The partitioning of heritable variation into additive (fixable) and non-additive (non-fixable) components is useful to provide information on the inheritance of quantitative characters. In order to develop hybrid varieties in brinjal, estimates of these effects are very useful. Keeping these in view, the present study is undertaken with the following objectives. To study the direction and degree of association between yield its attributing traits and quality, to study the heterosis for yield its attributing traits and quality, to study the combining ability for yield its attributing traits and quality and to study the nature of gene action governing yield its attributing traits and quality. A half diallel mating scheme was adopted to develop 21 hybrids in autumn-winter season of 2014-15 and the hybrids along with the seven parents and three checks were evaluated in RBD with three replications in the autumn-winter season of 2015-16 to accomplish the objectives. Correlation studies revealed that plant spread, days to 50% flowering, Days to first harvest and number of fruits per plant, possessed high significant positive correlation with total fruit yield, on the other hand total chlorophyll content exerted high significant positive correlation with total antioxidant capacity while days to 50% flowering, total sugar content, total anthocyanin possessed high significant negative correlation towards total antioxidant capacity. Path studies reveal that days to first fruiting, number of fruits per plant exert high direct effect on

yield and thus may be considered for selection. Total anthocyanin content of fruits, total chlorophyll content of fruits also exert high direct positive effect on total antioxidant capacity and thus may be considered for selection. Heterosis studies revealed that cross BRBL-02 × BRBL-04 possessed high significant heterobeltiosis for DFF, DFFr, DFH respectively. RB-2 × Muktakeshi possessed high significant heterobeltiosis and Shheterosis in the desirable direction for total fruit yield, while BRBL-01 × BRBL-04 was having high significant standard heterosis for total ascorbic acid, total chlorophyll content and total antioxidant capacity respectively. On gcabasis Rajendra baigan-2 was found to be the best general combiner in relation to Fruit yield per plant and total fruit yield, whereas BRBL-02 was found to be the best general combiner in terms of earliness while BRBL-01 was the best in relation to biochemical aspects. On sca basis Rajendra baigan-2 × Muktakeshi was found to be the best specific cross combination for FrYP and TfrY whereas BRBL-01 × BRBL-04 found to be the best specific cross combination in relation to biochemical parameters. Most of the traits were conditioned by both additive and non-additive gene action. However, most of the yields attributing traits were found to have preponderance of non-additive component suggesting postponing of the selection to later generations. RB-2 x Muktakeshi was found to be the best hybrid.

**Horticulture(Olericulture)**

Name of student	: Anisha Kumari	Degree	: M.Sc.(Ag) in Horticulture (Olericulture )
Father's name	: Sri Krishna Prasad	OGPA	: 7.700
Address	: Rimjhim computer, old courtroad vijay bazaar Nawada	College	: BAC, Sabour
Date of Birth	: 25/02/1990	Mobile NO.	: 9708175639
Roll No.	: M/Hort/162/BAC/2014-15	Category	: OBC
Name of Advisor	: Dr. Sangeeta Shree	Email Id	: anisharimjhim@gkmail.com
		Present Status	: Service in Bank

**Thesis Title : Genetic variability for bioactive molecules and antioxidant activity in garlic**

**ABSTRACT**

Garlic (*Allium sativum* L.) is considered as one of the most important species in onion family, Amaryllidaceae. Garlic is a source of various biologically active phytochemicals, including organosulphur compounds, phenolic acids, flavonoids, vitamins and nutrients. Wide diversity exists in garlic, their related species and wild types for morphological and biochemical properties. Evaluation and characterization provide a rapid, reliable and efficient tool of information to exploit genetic variability and to augment the utilization of germplasm. Keeping these informations in mind, the present investigation was framed with objectives (i) To characterize diverse genotypes on morphological and biochemical basis. (ii) To study the variability in the existing genotypes (iii) To establish inter relationship among various attributes under study. The study was accomplished by using 25 diverse garlic genotypes laid out in RBD in three replications in vegetable research farm, BAC, Sabour, during rabi season of 2014-15. The finding revealed that sufficient genetic variability was present among the genotypes which provide ample scope for selection of promising genotypes under study. Genotype 650 was the highest yielder (28.54g). WG 22 was the superior genotype in terms of total phenolic content (1301.09mgCE/100g), total flavonoid content (244.88mg CE/100g), phosphorous (.63%) and sulphur (9.03%) while radical scavenging activity (57.17%) and ascorbic acid (47.42mg/100g) was found maximum in IC 49387. All morphological and biochemical characters are significantly different within treatments. At genotypic and phenotypic level, yield per plant had significant positive correlation with length of leaf, breadth of leaf, no of clove per bulb, polar diameter, weight of clove, ascorbic acid and sulphur content. Antioxidant activity and RSA had high significant positive correlation with total phenolic content. D2 cluster analysis grouped the 25 genotypes into 6 clusters. Cluster V and VI was observed more distanced to each other.

**Horticulture(Olericulture)**

Name of student	: Ravi Kumar	Degree	: M. Sc. (Ag) in Horticulture (Olericulture)
Father's name	: Sri Subodh Kumar	OGPA	: 8.412
Address	: Karunabagh, PO+PS-sohsarai, Nalanda 803118	College Name	: BAC, Sabour
Date of Birth	: 05/05/1988	Mobile NO.	: 8271128013
Category	: SC	Email Id	: rk050588@gmail.com
Name of Advisor:	Dr. Randhir Kumar	Roll No.	: M/Hort/25/BAC/2011-12
		Present Status	: Service in, NCOH, Noorsarai, Nalanda (BAU, Sabour)

***Thesis Title : Heterosis and combining ability analysis for productivity and its related traits in round brinjal (Solanum melongena L.)***

**ABSTRACT**

The experiment entitled "Heterosis and combining ability analysis for productivity and its related traits in round brinjal (*Solanum melongena* L.)" was undertaken with the objectives (1) To estimate the magnitude of heterosis (2) To study the effect of gca of the parents and sca of F1s (3) To evaluate the incidence of bacterial wilt and fruit borer of high yielding brinjal. The material of genotype consisted of six diverse parents (SBRB-6/12, SBRB-1/12, KS-224, SBRB-2/12, Swarna Mani and SBRB-3/12) and their 30 F1s obtained by crossing in diallel fashion (including reciprocals) in randomized complete block design in three replications having each experimental unit of single row with spacing of 60 x 60 cm at Vegetable Research Farm, Department of Horticulture (Vegetable and Floriculture) Bihar Agricultural College, Bihar Agricultural University, Sabour, Bhagalpur during Rabi Season 2012-2013. Observations were recorded on the five plants from each plot maintained for eleven traits viz; Days to first flowering, Days to 50 % flowering, Fruit length (cm), Fruit diameter (cm), Average fruit weight (g), Plant height (cm), No. of Primary branches, Number of fruits per plant, Fruit yield per plant (kg) and Incidence of bacterial wilt & fruit borer infestation. Analysis of variance due to genotypes, parents and hybrids were almost highly significant for all the eleven characters except no. of primary branches and fruit borer incidence due to parents. However, for parents vs. hybrid only five characters viz.; fruit length, no. of primary branches, plant height and per cent incidence of bacterial wilt found highly significant. The crosses namely SBRB-3/12 x SBRB-2/12 (88.79), SBRB-6/12 x SBRB-3/12 (69.03) and KS-224 x Swarna Mani (66.08) were the best heterotic combination over standard parent Swarna Mani. The variances due to gca and sca were significant for almost character except days to 50 % flowering, fruit diameter and no. of primary branches per plant and sca were significant for all the eleven characters studied. Significant gca and sca were observed for all traits which also evidenced close association with per se performance. SBRB 3/12 was found best combiner for fruit yield per plant and lower incidence for bacterial wilt. Thus heterosis breeding method may be more rewarding for improvement in brinjal

**Horticulture (Olericulture)**

**Name of student** : Saksham Kumar Sinha      Degree : M.Sc.(Ag) in Horticulture (Olericulture)

**Father's name** : Shree Sudhir Kumar Sinha      OGPA : 8.420

**Address** : LIC Cololony,  
PO-Bahadur      College Name : BAC,Sabour  
PS-Zeromile      Mobile NO. : 9155728675

**Date of Birth** : 31/10/1973

**Category** : OBC      Email Id : sakshamkumarsinha@gmail.com

**Roll No.** : M/Hort/21/BAC/2011-12      Present Status: Service in capacity of Farm

**Name of Advisor** : Dr. R. B. Verma      Manager, KVK, BAU, Sabour

***Thesis Title : Effect of integrated use of inorganic and organic fertilizers on growth, yield and quality of onion (Allium cepa L.)***

**ABSTRACT**

Onion is one of the most important commercial vegetable crops grown in India, which earns about 70% of foreign exchanges among the fresh vegetable. It belongs to the family Amaryllidaceae. . In India it is cultivated in an area of 1.17 m ha with production of about 18.93 m t and an average productivity of 16.13 t/ha However, the area, production and productivity of onion in Bihar is 0.05 m ha, 1.25 m t and 22.97 t/ha respectively (NHB 2014-15). Use of chemical fertilizers, pesticide and insecticide etc. have increased the crop yield manifold but their excessive use caused environmental problems including soil, air and water pollution and finally or human health hazards and making the crop productivity unsustainable. Keeping in view the aforesaid facts, an investigation was carried out at Vegetable Research Farm at BAC Sabour during 2011-12. Fourteen treatments were arranged in randomized block design with three replications. The variety used was N-53. The data were recorded on various growth, yield and quality parameters and analyzed statistically. It was observed that application of 25% RDF+75% N of poultry manure showed significant influence on plant height (51.2cm), number of leaves (8.56), length of leaves (42.92cm), Chlorophyll 'a'(0.239 mg/g)Total chlorophyll (0.350 mg/g), No. of scale per bulb (9.13), length of bulb (5.75cm), diameter of Bulb (5.85cm), Average bulb weight (49.64gm), Bulb volume (60.28cc), total yield (288.41q/ha), Gross return (230728.00Rs/ha), net return (165861.00Rs/ha) and B:C ratio(2.66) with highest trends in this treatment, which was found better over the 25% RDF+75% N of VC, Sole application of PM for 100% N..

Therefore, it can be concluded that the application of 25% RDF + 75 % N of poultry manure was economically viable for commercial adoption for the cultivation of onion with improved soil quality leading to sustainability.

**Horticulture (Olericulture)**

Name of student	: Divakar Kumar Bharati	Degree	: M.Sc.(Ag) in Horticulture (Olericulture)
Father's name	: Sri Sachidanand Paswan	OGPA	: 8.420
Address	: Sahkund, Bhagalpur Bihar 813108	College Name	: BAC,Sabour
Date of Birth	: 05/03/1983	Mobile NO.	: 9709100264
Category	: OBC	Email Id	: dbharati788@gmail.com
Roll No.	: M/Hort/21/BAC/2011-12	Present Status	: Job in BAU
Name of Advisor	: Dr. R. B. Verma		

***Thesis Title : Effect of integrated use of inorganic and organic fertilizers on growth, yield and quality of onion (Allium cepa L.)***

**ABSTRACT**

Onion is one of the most important commercial vegetable crops grown in India, which earns about 70% of foreign exchanges among the fresh vegetable. It belongs to the family Amaryllidaceae. In India it is cultivated in an area of 1.17 m ha with production of about 18.93 m t and an average productivity of 16.13 t/ha. However, the area, production and productivity of onion in Bihar is 0.05 m ha, 1.25 m t and 22.97 t/ha respectively (NHB 2014-15). Use of chemical fertilizers, pesticide and insecticide etc. have increased the crop yield manifold but their excessive use caused environmental problems including soil, air and water pollution and finally or human health hazards and making the crop productivity unsustainable. Keeping in view the aforesaid facts, an investigation was carried out at Vegetable Research Farm at BAC Sabour during 2011-12. Fourteen treatments were arranged in randomized block design with three replications. The variety used was N-53. The data were recorded on various growth, yield and quality parameters and analyzed statistically. It was observed that application of 25% RDF+75% N of poultry manure showed significant influence on plant height (51.2cm), number of leaves (8.56), length of leaves (42.92cm), Chlorophyll 'a'(0.239 mg/g) Total chlorophyll (0.350 mg/g), No. of scale per bulb (9.13), length of bulb (5.75cm), diameter of Bulb (5.85cm), Average bulb weight (49.64gm), Bulb volume (60.28cc), total yield (288.41q/ha), Gross return (230728.00Rs/ha), net return (165861.00Rs/ha) and B:C ratio(2.66) with highest trends in this treatment, which was found better over the 25% RDF+75% N of VC, Sole application of PM for 100% N..

Therefore, it can be concluded that the application of 25% RDF + 75 % N of poultry manure was economically viable for commercial adoption for the cultivation of onion with improved soil quality leading to sustainability.

**Plant Breeding & Genetics**

Name of student	: Pawan Kumar	Degree	: M.Sc.(Ag) in Plant Breeding & Genetics
Father's name	: Sri Phuleshwar Baitha	OGPA	: 7.582
Address	: At-Bhawanipur , P.o.- Nagarpara Bhagalpur	College Name	: BAC, Sabour
Date of Birth	: 05/05/1992	Mobile NO.	: 8102983199
Category	: SC	Email Id	: Pawan.doct@gmail.com
Roll No.	: M/PBG/203/BAC/2014-15	Present Status	: Pursue Ph.D. Programme at BAU, Sabour
Name of Advisor	Dr. Tirthartha Chattopadhyay		

***Thesis Title : Characterization of the germin-like protein H gene  
from tomato (Solanum lycopersicum L.)***

**ABSTRACT**

Germin-like proteins are plant glycoproteins-family belonging. They are structurally similar but functionally diverse, and have been found to be involved in resistance of plants against several biotic and abiotic factors. Though characterized in different crop plants, detailed characterization of germin-like proteins in the important vegetable crop tomato has remained unexplored. In this study, a gene (SIGLPH) encoding a germin-like protein belonging to GER 2 sub-family of tomato has been characterized. Different physico-chemical properties of the SIGLPH protein were analysed in silico. The SIGLPH protein was found to share sequence similarity with plant auxin binding proteins with a predicted sub-cellular location at plant cell wall, indicating its possible involvement in auxin signalling in tomato plants. Structural model of the SIGLPH protein revealed characteristic-jellyroll structure with conserved active site architecture for metal ion (Mn<sup>2+</sup>) binding. Through semi-quantitative reverse transcriptase (RT)-polymerase chain reaction (PCR), the relative abundance of the SIGLPH transcript was found to be increased under abiotic stress conditions (salt, heat, and cold), indicating the stress-responsiveness of the gene. Conditions for recombinant SIGLPH protein expression [coded by either by the last 573 base pair (bp) partial coding DNA sequence or by the last 384 bp partial coding DNA sequence of the SIGLPH gene] in bacterial system were optimized, where the recombinant SIGLPH protein was observed to be solubilized in presence of low concentration (0.5 %, w/v) of ionic detergent (SDS) only. Hence, strategies were optimized for purification of the recombinant SIGLPH protein through immobilized metal affinity chromatography in presence of the ionic detergent (SDS). Through optimized purification strategy, purified recombinant SIGLPH protein was obtained at high yield and purity. This purified protein is suitable for use as antigen in order to raise polyclonal antibody against the SIGLPH protein, which will be indispensable for expression analysis of the SIGLPH gene at protein level. Thus, the present study paves the way for further detailed functional characterization of the SIGLPH protein in near future.



**Plant Breeding & Genetics**

Name of student	: Kumari Neha	Degree	: M.Sc.(Ag) Plant Breeding & Genetics
Father's name	: Sri Suresh Prasad Sah	OGPA	: 8.723
Address	: Sudin Chowk, Tatma Toli, Purnia	College Name	: BAC, Sabour
Date of Birth	: 10/12/1988	Mobile NO.	: 9122086452
Category	: OBC	Email Id	: neha708988@gmail.com
Roll No.	: M/PBG/204/BAC/2014-15	Present Status	: Pursue Ph.D. at BAU, Sabour
Name of Advisor	: Dr. Mankesh Kumar]		

***Thesis Title : Marker assisted selection for aromatic, semi-dwarf and photo insensitive segregants in F2 and BC1F1 generation in rice (Oryza sativa L.)***

**ABSTRACT**

Growing rice is an inevitable part in half of the world population who depends on it as their staple food. Rice consumers all over the world have strong preferences for the aromatic rice, the aroma of which is mainly due to accumulation of a compound 2-acetyl-1-pyrroline. Katarni rice is a famous aromatic landrace of Bihar having a problem of lodging and photo sensitivity resulting in its low productivity and restricted cultivation. Marker assisted selection was employed to select semi-dwarf and aromatic progenies in the BC1F1 and F2 population in a cross of Katarni with a rice variety Rajendra Sweta which was used as donor parent for photo insensitivity and semi-dwarf trait. The foreground selection was performed on 388 BC1F1s with the functional markers namely badh2 and sd1, an already reported aroma and semi-dwarfing genes of rice. Based on the foreground selection, 88 plants were selected that were homozygous both for aroma and sd1 allele. By looking the selected plants with respect to reduced plant height, early maturity and high value for grain and leaf aroma scores in potassium hydroxide sensory test, 15 BC1F1 plants were finally selected. Similarly in F2 population of Katarni/Rajendra Sweta, 9 desirable plants were selected on the basis of morphological and molecular data. The F2 and BC1F1 population were normally distributed for plant height and days of flowering. On the cut-off of mid parental value, a complementary gene action with the segregation ratio of 9:7 of tall vs. semi-dwarf plants at maturity and late vs. early maturing plants was observed in the F2 population. Presence of badh2 gene transcript was detected in the leaves of 7 days old seedlings in both the parents and few selected BC1F1 plants. The selected plants will be further evaluated in next generation for homozygous plants for earliness and semi-dwarf trait.

**Plant Breeding & Genetics**

Name of student	: Abhilasha Sinha	Degree	: M.Sc.(Ag) in Plant Breeding & Genetics
Father's name	: Sri Bijay Kumar Singh	OGPA	: 8.146
Address	: Village- Phulbaria, PostShahakund, Dist- Bhagalpur Bihar	College Name	: BAC, Sabour
Date of Birth	: 31/01/1991	Mobile NO.	: 9934543305
Category	: OBC	Email Id	: abhilasha.sinha31@gmail.com
Roll No.	: M/PBG/205/BAC/2014-15	Present Status	: Pursue Ph.D. at BAU, Sabour
Name of Advisor	: Awadhesh Kumar Pal		

**Thesis Title : Development of efficient shoot regeneration system  
in lentil (*Lens culinaris* Medik.)**

**ABSTRACT**

Lentil (*Lens culinaris* Medik.) is an important rabi pulse with high protein, iron and zinc content but its productivity of 611 kg/ha in India is far below the nations like Croatia (2862 kg/ha), New Zealand (2705 kg/ha) etc. The productivity of 1131 kg/ha in Bihar reveals the possibility for its improvement in other parts of the country as well. The lower yield of lentil in India may be due to continuous emergence of new pathogen (wilt, rust etc.) and sudden/abrupt climate change, which demands rapid development of suitable genotypes. Lentil is reported to be recalcitrant to in vitro processes which are very essential for rapid development of new genotypes through in vitro mutagenesis, somatic embryogenesis, somatic hybridization, transgenic development etc. Therefore, the current study was undertaken with two genotypes of lentil viz. Noori and Hul57 popularly grown in the eastern Gangetic plain of India. In this investigation nutrient media formulations for in vitro morphogenesis in lentil were optimized. Cotyledonary explants were the best for fresh shoot establishment as compared to apical and nodal segment from plants grown in open natural condition. Out of the various media combinations tried, 0.5 mg/l silver thiosulphate (STS) in combination with 2 mg/l indole acetic acid (IAA) was superior for micropropagation through nodal cuttings. Under shoot regeneration studied, no response was observed in leaves; however, stem internodes showed symptoms of shoot regeneration where somatic embryos developed after transferring them to tri-iodobenzoic acid (TIBA) (2.5 mg/l) after pre-treatment of 25 days with benzyl amino purine (BAP) (0.4 mg/l). The internodal length of 25 mm was most responsive to somatic embryogenesis in all the media tested. The best results for shoot regeneration were from embryonal axis, where fifteen shoots regenerated per explant on media containing 1.25 mg/l BAP. This tends towards the direct shoot regeneration after the incorporation of TIBA in the media. Media obtained in this study was efficient as far as Indian cultivars are concerned. Rooting is again a problem in lentil as in other pulses. The regenerated shoots from embryonal axis when excised at the basal end produced roots on MS media containing IAA (0.75 mg/l). Hardening of the shoots with 46% survival rate was found to be better in potting mixture containing

only coco-peat supplemented with Hoagland's solution on alternate days. Current investigation has brought some very good insight into the developmental processes of lentil at cellular level and the standardized nutrient media can further be used for the improvement of lentil against various constraints.

**Plant Breeding & Genetics**

Name of student	: Rahul Singh	Degree	: M.Sc.(Ag) in Plant Breeding & genetics
Father's name	: Sri Amrendra Singh	OGPA	: 7.931
Address	: Vill- Hanuman Ganj, Po- Rampur Bhaghela, Dist- Satna, Madhya Pradesh, 485115		
Date of Birth	: 15/12/1989	College Name	: BAC, Sabour
Category	: Gen	Mobile No.	: 9155171659
Roll No.	: M/PBG/207/BAC/2014-15	Email Id	: rahulgpb95@gmail.com
Name of Advisor	: Dr. Satyendra	Present Status	: Pursue Ph.D. at BAU, Sabour

***Thesis Title : Assessment of Genetic Potential for Submergence Tolerance in indica Rice (Oryza sativa L.)***

**ABSTRACT**

28 diverse rice genotypes including indigenous and exotic collections were screened for submergence tolerance at Research Farm of BAC, Sabour during Kharif 2015 with the help of morphological, biochemical and molecular studies aiming to reveal the effect of submergence on various morphological traits. It was also tried to know if the submergence tolerance, if any available, is due to SUB1 or there was any other gene responsible. The field trial was conducted with the same set of genotypes in control and submergence conditions simultaneously. One of the field trial was submerged completely at 30 DAT and remained submerged continuously for 18 days. Pre and post harvest data was collected for several important traits. Survival % was calculated in submergence experiment at 21st day of de-submergence. In biochemical study, ADH enzyme activity was analyzed while to work out allelic diversity, SSR primers were used. Gene specific primers for SUB1 were also used to confirm the presence of this QTL in the genotypes under study. Morphological data was subjected to statistical analysis for genetic variability, heritability, genetic advance, correlation coefficient, path analysis, and genetic diversity. Most of the yield contributing traits was drastically affected by the submergence. ADH was found to having a vital role for submergence tolerance in rice. Submergence tolerant genotypes, in general, has medium plant height and have no elongation ability during submergence due to which they show a better and balanced assimilation and consumption of carbohydrate. Out of 28 genotypes studied, three genotypes namely RYC-743, Purnendu, and IR 96321-315-402-B-1 can further be used as submergence tolerant genotypes.

**Plant Breeding & Genetics**

Name of student	: Anjali Kumari	Degree	: M.Sc.(Ag) in Plant Breeding and Genetics
Father's name	: Sri Ajay Kumar Singh	OGPA	: 6.835
Address	: Vill-Baijachak ,Pochiraiya, ps-Amarpur Banka	College	: BAC, Sabour
Date of Birth	: 09/12/1990	Mobile NO.	: 8409908644
Category	: GENERAL	Email Id	: lucy.anjali@gmail.com
Roll No.	: M/PBG/206/BAC/2014-15	Present Status	: -
Name of Advisor	Dr. Anil Kumar		

***Thesis Title : Genetic Divergence Study in Lentil (Lens culinaris Medik.) Genotypes***

**ABSTRACT**

Lentil (*Lens culinaris* Medik.) is one of the versatile food legumes with diversified uses as food, fodder and fuel. The present investigation on forty nine lentil genotypes collected from various places like ICARADA, Lebanon, IIPR, Kanpur, G.B.P.U.A. & T., Pantnagar, Uttarakhand, NBPGR, New Delhi and from various places in Lakhisarai region of Bihar was carried out in Rabi 2015-16 area specified to pulse section at Bihar Agricultural University, Sabour under normal and late sown condition in simple lattice design with two replication to study the genetic variability, heritability and genetic advance for quantitative traits, to assess character association and path coefficient analysis of quantitative traits in normal and late sown condition, to assess genetic diversity in the accessions for yield and its attributing traits and group them into clusters in normal and late condition, and to identify high yielding suitable parents for future breeding programme through Mahalanobis D2 statistics based on fifteen characters.

Significant treatment differences were found for all the characters under study except number of primary branches per plant. In general, phenotypic coefficients of variation (PCV %) were higher than genotypic coefficients of variation (GCV %). Highest PCV % and GCV % were noted for wilt incidence followed by harvest index, plot yield, grain yield per plant, number of pods per plant and biological yield per plant in normal sown condition whereas, in late sown condition highest value of PCV and GCV were recorded for harvest index followed by number of pods per plant, number of seeds per pod and grain yield.

High heritability (%) along with high genetic advance as % of mean was registered for plot yield, days to 1st flowering, days to 50% flowering, biological yield per plant, 1000 seed weight, harvest index, grain yield per plant and number of pods per plant, indicating that these characters are governed by additive gene effects and directional selection for these traits would be more effective.

Association of character among grain yield and component traits including direct and indirect effect in lentil, the phenotypic correlation revealed that number of pods per plant and biological yield per plant had positive and highly significant association with grain yield under normal sown condition whereas, under late sown condition the positive and highly significant association was observed among number of pods per plant, plant height, and biological yield per plant with grain yield per plant though, days to first flowering, days to fifty percent flowering and days to maturity had negative and highly significant association with grain yield at the phenotypic level.

Path analysis in both normal and late sown condition revealed that biological yield per plant had maximum and positive direct effect on grain yield whereas, days to first flowering, days to fifty percent flowering and days to harvest had negative direct effect on grain yield under both normal and late sown condition while, days to maturity had negative direct effect on grain yield under normal condition only at phenotypic level. Thus, the improvement of grain yield in lentil genotypes under study can be achieved only through direct or indirect selection of traits viz; biological yield per plant, days to first flowering, days to fifty percent flowering and days to harvest, days to maturity.

On the basis Mahalanobis D<sub>2</sub> statistics eight clusters were formed. Among the eight clusters, cluster VII consisted maximum number of genotypes (13) accounting for 26.53 per cent towards total genetic diversity followed by cluster III (12) accounting for 24.48 per cent towards total genetic diversity, cluster IV (8) accounting for 16.32 per cent towards total genetic diversity, cluster V and VI (4 each) accounting for 8.16 per cent towards total genetic diversity and cluster VIII (3) accounting 6.12 percent towards total genetic diversity whereas, cluster II was monogenotypic accounting for 2.04 percent of towards total genetic diversity under timely sown condition where as in late sown condition among the eight clusters, cluster IV consisted maximum number of genotypes (10) accounting for 20.40 per cent of total genotypes followed by cluster VI (9) accounting for 18.36 per cent of total genotypes, cluster II and V (eight each) accounting for 16.32 per cent of total genotypes, cluster I (six), accounting 12.24 percent of total genotypes, cluster III (4) accounting for 8.16 per cent of total genotypes Whereas cluster VII and VIII (two each) were accounted for 4.08 percent of total genotypes. Based on inter-cluster distance and mean performance of clusters for different traits, the advance breeding line among genotypes like, X-2011S-208, LKH-4, LKH-2 and GP-4073 are expected to produce desirable segregants for yield and other yield related traits. Plot yield contributed maximum towards genetic divergence followed by plant stand at harvest, number of pods per plant and biological yield per plant under both condition.

**Plant Pathology**

Name of student : SAURAV KUMAR Degree : M.Sc. (Ag) Plant Pathology  
Father's name : Sri Binay Kumar Singh OGPA : 8.227  
Address : At + PO- Rahatpur,  
PS- Balia;  
Distt: Begusarai-851211 College Name : BAC, Sabour  
Date of Birth : 02/05/1989 Mobile NO. : 8051432295  
Category : General Email Id : Sauravag072@gmail.com  
Roll No. : M/P.P./209/BAC/2014-15 Present Status : AFO (Allahabad Bank)  
Name of Advisor : Dr. R. N. Gupta

***Thesis Title : Epidemiology of Chickpea Stunt Disease*****ABSTRACT**

Chickpea stunt disease (CpSd) caused by bean (pea) leaf roll virus and transmitted by aphid is an emerging disease of chickpea. Affected plants can be easily identified in the field by their yellow, orange or brown discoloration, shortened internodes and stunted growth. Survey conducted in Bhagalpur and Banka districts showed that CpSd incidence was 3.2-9.6% and 2.6-8.3% respectively. Temporal dynamic of CpSd showed that early sown crop (1st November) had minimum Percent Disease Incidence (PDI) 0.8% (1st December) and increased up to 40.2 % (28th February) similarly in mid sown crop (15th November) PDI 0.8% (10th December) and increased up to 39.2% (28th February) while in late sown crop (30th November) it was observed 1.4% (30th December) and increased up to 31.9%(28th February).The temporal dynamic of aphid population showed that early sown crop aphid population was minimum 2.4 (1st December) and increased up to 41.2% (9th January) similarly in mid sown crop aphid population was 2.2 (18th February) and increased up to 36.4 (9th January). In late sown crop, minimum aphid population was observed 2.2(18th February) later on they were abruptly increased up to 31.4 (9th January) later on decreased sharply up to 6.4(8th February). Effect of different dates of sowing on the CpSd development found maximum in early date of sowing (11.94 - 41.72% ) followed by mid date of sowing (10.94 - 39.10%) and late date of sowing (14.09- 31.63%).Weather parameters showed that there was positive correlation between aphid population and incidence of CpSd and it was found more in variety JG315 and less in variety GCP105.Independent variables like temperature (max.) and relative humidity (max.) were negatively correlated with CpSd development. However Temperature (min) relative humidity (min), rainfall and aphid population showed a relationship with positive impact. Transmission study showed that the acquisition feeding period of aphid was 3 hours for 3.03 percent transmission, however, inoculation feeding period was 6 hours for 3.7 percent transmission of the disease. The threshold population was 5 aphids which transmitted 2.6 percent disease incidence. Moreover, CpSd incidence and aphid populations were affected by weather parameters which adversely affected the yield and yield attributing characters in chickpea.

**Soil Science & Agricultural Chemistry**

Name of student	: Shyam Nandan Kumar	Degree	: M.Sc.(Ag) Soil Science & Agricultural Chemistry
Father's name	: Sri Niranjan Kumar	OGPA	: 7.987
Address	: AT- Kailashpuri Colony, Mirjanhat, Bhagalpur	College Name	: BAC, Sabour
Date of Birth	: 26/02/1987	Mobile NO.	: 9934564841
Category	: GENERAL	Email Id	: kr.shyam001@gmail.com
Roll No.	: M/SSAC/107/BAC/2014-15	Present Status	: Service in Agriculture
Department			
Name of Advisor	: Dr. B. B. Mishra		

***Thesis Title : Impact of Organic amendments of arsenic load in whet crop***

**ABSTRACT**

Soil act as a major sink for all kind of inputs, but injudicious and indiscriminate use of contaminants leads to increased contamination of soil and pollutes the environment. Geogenic arsenic level, particularly in West Bengal and Bihar regions poses serious threat to the environment. Thus soil became contaminated with natural and anthropogenic activities. It is well known fact that soil is the main source of input for crop also. Hence, soil quality must be ensured for getting quality food. Keeping this view in mind, the research problem proposed was "Impact of organic amendments on arsenic load in wheat (*Triticum aestivum* L.)".

The above study revealed that under control condition, the arsenic content per pot in different plant part of wheat crop such as root, stem, leaves and grains, were 32.27, 22.26, 14.44 and 9.77  $\mu\text{g g}^{-1}$ , respectively. Application of Paddy husk (@ 10 t ha<sup>-1</sup>) resulted that arsenic content per pot in different part of wheat crop such as root, stem, leaves and grains were 27.75, 17.79, 11.87 and 8.08  $\mu\text{g g}^{-1}$  respectively. Vermicompost (@ 10 t ha<sup>-1</sup>) resulted arsenic content per pot in different part of wheat crop such as root, stem, leaves and grains were 30.45, 18.08, 12.81 and 9.17  $\mu\text{g g}^{-1}$  respectively. Arsenic had an antagonistic relationship in terms of nutrient uptake in different parts of the wheat crop. The post harvest analysis of soil revealed that arsenic content under control, paddy husk and vermicompost treated soil were 1.18, 0.98 and 1.12  $\mu\text{g g}^{-1}$ , respectively. Arsenic content was highest in root, whereas it was lowest in grain. It was also observed that arsenic content was significantly decreased in paddy husk treatment as compared to vermicompost and control condition at 95% confidence interval.

The study concluded that application of paddy husk @ 10 t ha<sup>-1</sup> significantly reduces the arsenic content in grain.



**Soil Science & Agricultural Chemistry**

Name of student : Amarjeet Kumar Degree : M.Sc.(Ag) in Soil Science & Agricultural Chemistry

Father's name : Sri Ram Gulam Ram OGPA : 8.339

Address : Vill- Rupauliya  
Po-Khangraitha Ps-Baheri  
District : Darbhanga, Bihar College Name : BAC, Sabour

Date of Birth : 19/01/1990 Mobile NO. : 7070933733

Category : SC Email Id : amarjeet9126@gmail.com

Roll No. : M/SSAC/182/BAC/2014-15 Present Status : Admitted in Ph.D.  
Programme at BAC, Sabour

Name of Advisor : Dr. Y. K. Singh

***Thesis Title : Soil fertility status as influenced by land use in Banka district of Bihar***

**ABSTRACT**

Increasing population pressure has historically resulted in land use change from natural forest to cultivated and grazing land with subsequent changes. Land use changes due to deforestation, conversion of rangeland to cropland and cultivation are known to result in changes in soil fertility. Handling suitable land use systems can help in sequestering carbon in the soil and ultimately decline the ill-effects of global warming. The Banka district is located in South Bihar Alluvial plain zone (i.e. Agro climatic Zone IIIA) of Bihar. The major land use types found in Banka district are forests (43310ha), cultivated land (16040 ha), grazing lands (1700 ha) and orchards (7300 ha). The agricultural productivity of Banka district is low due to undulating terrain and lack of irrigation facilities and also unstable due to extreme changes in weather conditions. The present study was planned to evaluate the effects of different land uses on the various soil fertility parameters and active pools of carbon in Banka district of Bihar. To fulfill the objective, triplicate soil samples were collected from six locations across four land use systems viz. forests, grazing, cultivated and orchards lands from two soil depths (0-15 and 15-30 cm). Results show that bulk density was highest in the cultivated land (1.59 Mg m<sup>-3</sup>) and lowest in the forest lands (1.52 Mg m<sup>-3</sup>). The aggregate stability has found in the order cultivated < grazing < orchard < forest for both surface and subsurface soil samples. The soil pH under different land uses was slightly acidic but in case of cultivated land it was approaching towards normal pH. Soil organic carbon (SOC) at the 0-15 cm and 15-30cm soil depth in the cultivated lands was 47, 23 and 13; and 37,12 and 12 per cent lower than the forests, orchards and grazing lands ; in the same order. In case of macronutrients the trend towards nutrient availability was as forests > orchards > grazing > cultivated lands. Similar trend was also observed in case of micronutrients Mn, Fe, Cu.

In surface soil, Zn was the highest in cultivated land and was the lowest in grazing and orchards lands. Among the different active carbon pools, the highest water soluble carbon (WSC), water soluble carbohydrate (WSCHO), Potassium permanganate oxidizable carbon (PmOC) and soil microbial biomass carbon (SMBC) were recorded in forest soils followed by orchards, grazing

**Soil Science & Agricultural Chemistry**

Name of student	: Ajeet Kumar	Degree	: M.Sc.(Ag) in Soil Science & Agricultural Chemistry
Father's name	: Sri Kamal Narayan Yadav	OGPA	: 8.242
Address	: AT+PO+PS-NIRMALI, THANA ROAD District : Supaul, Bihar	College Name	: BAC, Sabour
Date of Birth	: 23/01/1991	Mobile NO.	: 7070220944
Category	: OBC	Email Id	: kajeet16@gmail.com
Roll No.	: M/SSAC/181/BAC/2014-15	Present Status	: Admitted in Ph.D. Programme at BAC, Sabour
Name of Advisor	: Dr. Sankar Ch. Paul		

***Thesis Title : Effect of vermicompost application on  
nitrogen dynamics in Soil***

**ABSTRACT**

Nutrient recycling is now being considered as part of the concept of integrated nutrient management. The fertilizer potential of vermicompost is often attributed to its different concentrations and amounts of nutrients, especially nitrogen. Therefore, a dissertation work was taken at Department of Soil Science and Agricultural Chemistry, Bihar Agricultural University, Sabour to study the Effect of vermicompost application on nitrogen dynamics in soil. So, pot experiment has been taken under two different sets: (a) N transformation under the effect of root rhizosphere and (b) through laboratory incubation study. Treatments were T1 = control, T2 = chemical fertilizer (N:P:K :: 80:40:40), T3 = 2250 mg vermicompost kg-1 soil, T4 = 4500 mg vermicompost kg-1 soil, T5 = 9000 mg vermicompost kg-1 soil, T6 = 18000 mg vermicompost kg-1 soil. Results showed that vermicompost of water hyacinth and coconut leaf showed almost similar pH and EC values. CEC value for both vermicompost were 74.20 and 72.60 cmol(+)kg-1. Organic carbon content in water hyacinth vermicompost was 23.1% and in coconut leaf vermicompost 22.5%. Water holding capacity was much higher. Available form of N, P, K, S, Zn, Cu, Mn and Fe found very less content with respect to total content except K and Na content in both types of vermicompost. Available part was more pronounced in water hyacinth vermicompost. Microbial population accounted higher in water hyacinth vermicompost than coconut leaf vermicompost. Water hyacinth vermicompost also contains higher values of dehydrogenase activity, microbial biomass carbon content and urease enzyme activity. Results represented that water hyacinth vermicompost is better in quality than coconut vermicompost with respect to microbial properties. Under greenhouse study with cauliflower at different levels of vermicompost resulted maximum release of available N at 10th day in T6 which was 49.38% over control followed by T5, T4, T2, T3 and T1. But changes of its content in soil through incubation study over the period showed maximum release at different dates under different treatments. Available nitrogen content increased slowly

and reached to peak at 40th day and 50th day that may be due to addition of organic substrate through vermicompost which leads to the maximum activity of microbes. Ammonium N content changes in soil is quite similar to the available nitrogen in greenhouse study. But in incubation study changes is differ. Nitrate nitrogen content changes quite dissimilar to the ammonium content. Nitrate content increased slowly and reached to maximum at 40th day after addition of vermicompost in both experiment. N content in cauliflower whole plant significantly and positively correlated ( $r = 0.88^{**}$ ) to soil available nitrogen content. Average content of soil available nitrogen was significantly and positively correlated to N content in curd ( $r = 0.94^{**}$ ) and plant dry matter weight ( $r = 0.98^{**}$ ). From this study, it may be inferred that vermicomposts produced from different biomass substrate are different in quality with respect to nutrient contents and microbial properties. Ten days prior application of vermicompost can provide maximum support of nitrogen to the plant which can maximize nitrogen use efficiency for crop production.

**Soil Science & Agricultural Chemistry**

Name of student	: Ranjeet Kumar	Degree	: M.Sc.(Ag) in Soil Science & Agricultural Chemistry
Father's name	: Sri Bateshwar Mandal	OGPA	: 7.944
Address	: VILLAGE - CHANDPUR, POST - GOGRI Khagaria	College Name	: BAC, Sabour
Date of Birth	: 27/07/1981	Mobile NO.	: 9608411200
Category	: SC	Email Id	: ranjeetrdx10@gmail.com
Roll No.	: M/SSAC/176/BAC/2014-15	Present Status	: -
Name of Advisor	Dr. Mahendra Singh		

***Thesis Title : Evaluation of Vesicular arbuscular Mycorrhizal (VAM) fungi on Bioavailability of Zn in Direct Seeded***

**ABSTRACT**

AM fungi plays very important role in the increase the root surface area and uptake of some macro and micronutrients. In direct seeded rice (DSR), the plant availability of micronutrients like Zn is likely to be less. Considering facts, a pot experiment was conducted in the Department of Soil Science and Agricultural Chemistry, Bihar Agricultural University, Sabour on "Evaluation of vesicular arbuscular mycorrhizal (VAM) fungi on bioavailability of Zn in direct Seeded rice (*Oryza sativa* L.)". Four AM fungi species were evaluated under zinc deficient soil in completely randomized design (CRD) with three replications. Among all the AM fungi species, plant height was found maximum under the treatment T3 (*Glomus mosseae* + 100% RDF NK). The root dry weight was maximum (3.12 g) in treatment T3 (*Glomus mosseae* + 100% RDF NK), which was observed significantly higher when compared with other treatments. Maximum AM colonization and spore count was observed at panicle initiation stage with the application of same treatment. The higher microbial populations were recorded at panicle initiation stage with application of treatment T3 (*Glomus mosseae* + 100% RDF NK). This treatment also gave maximum dehydrogenase activity (55.86  $\mu\text{g TPF g}^{-1} 24 \text{ hr}^{-1}$ ), acid phosphatase activity (0.299 mg PNP  $\text{g}^{-1} \text{ hr}^{-1}$ ) and alkaline phosphatase activity (0.54 mg PNP  $\text{g}^{-1} \text{ hr}^{-1}$ ) followed by application of treatment T6 (*Gigaspora decipien* + 100% RDF NK) at panicle initiation stage. Application of treatment T3 (*Glomus mosseae* + 100% RDF NK) significantly increased DTPA extractable Zn in soil and Zn content in plant when compared with all the treatments but found at par with the application of treatment T6 (*Gigaspora decipien* + 100% RDF NK). The maximum zinc uptake (0.056 mg  $\text{pot}^{-1}$ ) by grain was recorded under treatment T3 (*Glomus mosseae* + 100% RDF NK) followed by application of treatment T6 (*Gigaspora*

decipien + 100% RDF NK). Highest grain yield (14.08 g pot<sup>-1</sup>) was found with the treatment T3 (Glomus mosseae + 100% RDF NK) among all AM fungi species and it was at par with the treatment T2 (100% RDF). As evident from the results, among all the AM fungi species Glomus mosseae sp. can effectively modify the soil microbe population and community structure by increasing the soil enzymatic activities and significantly increased the zinc uptake by grain in DSR rice, when compared with other applied AM fungi species.

**Soil Science & Agricultural Chemistry**

Name of student	: Abhishek Kumar	Degree	: M.Sc.(Ag) in Soil Science & Agricultural Chemistry
Father's name	: Sri Rajbansh Chaubey	OGPA	: 7.519
Address	: Panjar Colony, Gaurakshani,Sasaram, Dist-Rohtas,Pin-821115	College Name	: BAC, Sabour
Date of Birth	: 26/09/1990	Mobile NO.	: 9801994046
Category	: General	Email Id	: abhishek.3881@gmail.com
Roll No.	: M/SSAC/183/BAC/2014-15	Present Status	: Bank employee
Name of Advisor	: Dr. Rajiv Rakshit		

***Thesis Title : Microbial resistance and resilience of balanced fertilized and nanomaterials added soils under heat stress***

**ABSTRACT**

Soils are increasingly under environmental pressure most often related to the intensification of anthropogenic activities. Given the crucial importance of maintaining soil functions, understanding the response of soil ecosystems to disturbance or environmental change and the resistance and resilience of soil microorganisms is a key challenge. To maintain these crucial soil functions, it is important to know how soil microorganisms respond to disturbance or environmental change.

Keeping this hypothesis in view, an incubation experiment was conducted with two objectives 1) To assess the impact of fertilization and nanomaterials on changes in enzyme activities and microbial biomass in relation to heat stress and 2) To estimate the resistance and resilience indices of soils with added fertilizers and nanomaterials. To achieve these objectives, two sets of experiment were conducted: first set represents a system reflecting the impact of long term residue management in soils and the second one is related to the exposure of control soils with nano zinc and nano iron (both at 10 and 40 ppm). Both the systems were exposed to heat stress by putting them at 48°C for 24 hours to quantify their resistance and resilience.

Results from permanent plot experiment showed the reduction of enzymatic activity after exposure to heat stress (23-46% in FDA, 11-94% in acid phosphates activity, 32-113% in alkaline phosphatase and 23-39% in dehydrogenase activity). Microbial biomass carbon was increased with the application of organic residues (15-23% increase) than control on 0 day, but after stress there was a decline in the tune of 12-48% (1 day of incubation). Enumeration of microorganisms showed an increase in their count in the integrated treatments. Resistance and resilience indices values showed that application of organics in culmination with inorganic fertilizers improved

**Soil Science & Agricultural Chemistry**

Name of student	: Afzal Ahmed	Degree	: M.Sc.(Ag) in Soil Science & Agricultural Chemistry
Father's name	: Sri Abdul Quddush Ansari	OGPA	: 7.749
Address	: At- karahi khurd po+ps basantpur Siwan	College Name	: BAC, Sabour
Date of Birth	: 14/01/1990	Mobile NO.	: 8603146660
Category	: EBC	Email Id	: afzalahmed89@gmail.com
Roll No.	: M/SSAC/173/BAC/2014-15	Present Status	: Pursue Ph.D at BAU, Sabour
Name of Advisor	: Dr. N. Chattopadhyaya		

***Thesis Title : Efficacy of Potassium Solubilizing Bacteria on Waste mica in relation to Potassium uptake and dynamics under Maize rhizosphere.***

**ABSTRACT**

Potassium, third major element, originally known as Kelium (K), plays a vital role in plant growth and development. As potassium is extremely mobile within the plant system, it helps to regulate the opening and closing of stomata in the leaves and uptake of water by root cells. Indian soil has not been deficient in potassium since long. Non judicious application of inorganic nitrogenous fertilizer and omission of providing phosphatic and potassic fertilizers by peasant community due to inordinate price hike as well as preference to high yielding cultivars put the soil health at stake.

To combat with this warning situation, resident microflora, present in the plant rhizosphere should be brought in to use to provide the bio-available potassium from fixed and unavailable pool of potassium by various mechanisms including acidolysis, chelation, exchange reactions, complexolysis, and production of organic acids. Therefore, the objective of this research is i) to study efficiency of potassium solubilizing microorganism and ii) to study the release kinetics of potassium from waste mica in maize rhizosphere. A pot experiment having 10 treatments {T1: Control, T2: Recommended Dose Of Fertilizer (RDF), T3: Full N and P+75% K and rest 25% by Waste Mica, T4: Full N and P+50% K and rest 50% by Waste Mica, T5: T3+KSB1(*Fraturia aurantia*), T6: T4+KSB1, T7: T3+KSB2 (*Bacillus edaphicus*), T8: T4+KSB2 T9: T3+KSB1+KSB2 and T10: T4+KSB1+KSB2 } was conducted using Maize (Var: SHM 1) as the test crop.

The K solubilising power of the microorganisms showed a promising result (co-inoculation of two bacteria) in laboratory incubation and that was also observed in the results obtained from pot experiment. The observations were recorded at three different stages viz, Knee high stage, Silking stage and harvesting stage. The results revealed that the water soluble, exchangeable and non-exchangeable pools of K over different stages ranged from 3-5%, 9-10% and 85-88% respectively. Correlation studies among biomass yield, K uptake and different pools of K showed a significant



relationship. T10 (T4+ KSB1+KSB2) has been found to be the best. It is observed that application of waste mica co-inoculated with potassium solubilizing microorganisms (*Fraturia aurantia* & *Bacillus edaphicus*) have a significant effect on biomass yield and potassium uptake by maize rhizosphere when waste mica, used as potassium source.

Similarly, bacterial intervention of mica improves the water-soluble, exchangeable and non-exchangeable K pools in soils, thereby influences the K dynamics in a positive manner upon those pools and thus increased the bioavailability. Thus, bio-intervention of waste mica could be an alternative and viable technology to solubilize insoluble K into bio available form and could be used efficiently as a source of potassium bio-fertilizer for sustaining crop production.

**Soil Science & Agricultural Chemistry**

Name of student	: Akhila Nand Dubey	Degree	: M.Sc.(Ag) in Soil Science & Agricultural Chemistry
Father's name	: Sri Ram Anuj Dubey	OGPA	: 8.383
Address	: Vill- Dhanapur, Podhanapur District : Chandauli State : Uttar Pradesh		
Date of Birth	: 01/01/1994	College Name	: BAC, Sabour
Category	: Gen	Mobile NO.	: 8271511811
Roll No.	: M/SSAC/175/BAC/2014-15	Email Id	: akhilanandd@gmail.com
Name of Advisor	: Dr. N. Chattopadhyay	Present Status	: Pursue Ph.D. Programme at BHU, Varanasi

***Thesis Title : Efficacy of various Nano-Zinc Sources combined with Zinc Mobilizers under Rice Rhizosphere***

**ABSTRACT**

Zinc is essential micronutrient having vital role in enzymatic activity. As per report of the All India Coordinated Research Project (AICRP) on secondary, micronutrient, pollutant and toxic elements in soils and plants 49% of Indian soils are deficient in Zn. Coarse texture sandy soils, high pH, low organic matter content, intensive cereal-cereal cropping system with high yielding variety often accentuates Zn deficiency. Rice rhizosphere represents typical physico-chemical environment in terms of lower redox potential, causing precipitation of applied Zn in various mineral form.

Zn use efficiency rarely exceeds 1-5%, despite sincere scientific effort worldwide. Zn is not only essential for plant but also for human. Grain enrichment of Zn through scientific intervention (microbial and nano-formulation) were studied in a pot experiment using rice (Var. Rajendra mahsuri) as a test crop). Experimental soil was deficient in DTPA extractable Zn (0.48 mg kg<sup>-1</sup>). Conventional Zn sources (ZnSO<sub>4</sub> · 7H<sub>2</sub>O) with two modes of application (Soil and foliar) was compared with Zn solubilizers (*Azospirillum brasilense*) and two types of nanoformulations (ZnO as spray and Zincated nanoclay polymer composite (ZNCPC) were evaluated in their phenological growth stages of rice (maximum tillering, panicle initiation and harvesting). Effect of various source and modes of application of Zn on soil chemical (pH, EC, CEC, DTPA extractable Zn content in soil and Zn fractions), microbiological (Microbial counts, microbial biomass carbon, dehydrogenase, acid and alkaline phosphatase activity) were studied and correlated with Zn content and Zn uptake.

DTPA extractable Zn content was found maximum at panicle initiation stage in T6 (NCPC\* based Zinc) (3.60 mg kg<sup>-1</sup>soil) followed by T4 (RDF+ *Azospirillum brasilense*) (3.52 mg kg<sup>-1</sup>). Sequential fractional study of Zn revealed that at panicle initiation stage in T4 (RDF+*Azospirillum brasilense*) there was reduction in residual Zn content (19%) whereas water soluble and exchangeable Zn increased by 2%. T6 (NCPC\* based Zinc) increased water soluble and exchangeable Zn by 4%.

Dehydrogenase activity was maximum at maximum tillering stage in T6 (NCPC\* based Zinc) ( $62.27 \mu\text{g TPF hr}^{-1}\text{g}^{-1}$  soil) followed by in T4 (RDF+Azospirillum brasilense) ( $61.75 \mu\text{g TPF hr}^{-1}\text{g}^{-1}$  soil). Acid and alkaline phosphatase activity were found maximum at panicle initiation stage in T6 (NCPC\* based Zinc) ( $198.37 \mu\text{gPNPg}^{-1}\text{hr}^{-1}$ ) ( $243.14 \mu\text{gPNPg}^{-1}\text{hr}^{-1}$ ) followed by T4 (RDF+Azospirillum brasilense) ( $196.10 \mu\text{g PNPg}^{-1}\text{hr}^{-1}$ ) and T4 (RDF+Azospirillum brasilense) ( $220.39 \mu\text{g PNPg}^{-1}\text{hr}^{-1}$ ). Zn uptake was found maximum in T6 (NCPC\* based Zinc) ( $303.42 \text{ g kg}^{-1}$ ) followed by T4 ( $275.30 \text{ g kg}^{-1}$  soil). Apparent Zinc recovery was maximum found in T6 (25.56%) followed by T5 (15.25%) and T4 (10.76%).

Use of NCPC, Nano Zn sprays (ZnO) and Zn solubilizer (Azospirillum brasilens) proved to be promising technology in increasing Zn use efficiency under rice rhizosphere on pot experimentation. However, these products need to be evaluated in field experiment on a long-term basis for benefit: cost ratio and wide scale farmer's adaptability.

**Livestock Production Management**

Name of student	: Papu Kumar Das	Degree	: M.V.Sc. in Livestock Production Management
Father's name	: Sri Shiram Das	OGPA	: 7.395
Address	: Vill- Govindpur, P.O. : Madarpur District : Khagaria 851213	College Name	: BVC, Patna
Date of Birth	: 10/07/1981	Mobile NO.	: 8873915899
Category	: SC	Email Id	: dr.pk100781@gmail.com
Roll No.	: M/LM/113/BVSC/2013-14	Present Status	: -
Name of Advisor	: Dr. R.K. Nirala		

***Thesis Title : Feeding Management with supplementation of Live yeast culture (*Saccharomyces cerevisiae*) on performance of Local female Goats of Bihar***

**ABSTRACT**

The study was conducted at sheep and Goat farm, Livestock Production Management section, ILFC, B.V.V., Patna (Bihar). The experiment was conducted on twenty female kids of age 3 to 4 months of local area of Patna goats which were divided into two groups of ten kids each based on their average body weight (6.42±0.28 kg). The experiment was lasted for 120 days (November to March). One of the groups was supplemented with "Saccharomyces cerevisiae" NDCD-49, and the second groups without any supplementation which served as control. The body weight of kids were significantly influenced by treatments. The total body weight gain at the end of experiment was higher in the treatment groups (4.9±0.04 kg) as compare to control group (3.9±0.04 kg), and the difference was statically significant (P<0.01). The average daily live weight gain for the entire growth period was significantly higher (43.81±0.41 g) in live yeast culture fed groups as to control groups (35.05±0.40 g). Body length of live yeast fed group was marginally higher in comparison to control group but the difference was not significant. The final height at withers for control and live yeast fed group was 50.12±0.55 and 53.1±0.34 cm respectively. The final heart girth for control and live yeast fed group was 52.17±0.38 and 55.2±0.32 cm, respectively. Fortnight average dry matter intake for control was 311.30±9.49 and for live yeast fed group was 330.44±7.36 g/day/kid respectively which was Non significant. The overall FCR for control group was 8.89 and for treated group was 7.65 resulting in significant (P<0.01) difference between the two groups. Rumen fermentation showed no significant difference in pH and total nitrogen concentration. However, supplementation of concentrate with live yeast culture showed significant effect on TVFA, NH<sub>3</sub>-N and cfu concentration in strained rumen liquor of kids, The incidence of diarrhea outbreak (40%) was repeated in control group with less severity as compared to live yeast fed group (10%). Net profit per kids was relatively higher (Rs. 1,122.85) in comparison to control group (Rs. 828.15). It could be concluded that saccharomyces cerevisiae NDCD-49 supplementation along with concentrate mixture showed the best performance with respect to growth, feed conversion efficiency and economic efficiency.

**Animal Genetics & Breeding**

Name of student	: Dr. Vinita Yashveer	Degree	: M.V.Sc in Animal Genetics & Breeding
Father's name	: Sri Sabhapati Roy	OGPA	: 8.689
Address	: Salempur Dumra, Raja Bazar, Patna-14	College Name	: Bihar Veterinary College, Patna-14
Date of Birth	: 12.09.1983	Mobile NO.	: 8083734605
Category	: BC	Email Id	: Vinitay83@gmail.com
Roll No.	: VP/BVC/AGB-05 /2013-14	Present Status	: Pursue Ph.D. (AGB), BAU, Patna
Name of Advisor	: Dr. K.G. Mandal		

***Thesis Title : Vanaraja and its crosses with Desi chicken of Bihar*****ABSTRACT**

The present study was conducted on Vanaraja and its crosses with Desi chicken native to South and North Gangetic plane of Bihar. Vanaraja was maintained in the Instruction Livestock Farm Complex (ILFC), Bihar Veterinary College, Patna on random mating. Male birds of Desi chicken were brought into the farm from different districts of Bihar for crossing with the females of Vanaraja. Thus, the three genetic groups so constituted were as follows:

**Purebreds**

1. VN♂♂ × VN♀♀

**Crossbreds**

Muz Desi♂♂ × VN♀♀

Gaya Desi♂♂ × VN♀♀

Twenty (20) males and hundred (100) females were taken from each genetic group and maintained separately under deep litter system with a mating ratio of 1 male: 5 females to study genetic effect on egg weight and egg quality traits. To study the genetic effect on egg quality traits a total of 50 eggs from each genetic group were collected at random from each of three genetic groups. To find out the effect of egg weight on egg quality traits all the eggs were divided into four different groups with a difference of 6 g from each group.

Findings. The age at sexual maturity was found to be shorter in VN × VN as compared to its crosses with the local Desi/local chicken of Bihar. Eggs laid by Vanaraja were significantly ( $P < 0.05$ ) heavier than the eggs laid by Muzaffarpur (Muz) Desi × VN and Gaya Desi × VN both at the age of sexual maturity and at 40 weeks of age. There was no significant difference in average egg weight

laid by both the crosses. The genetic group was found to have highly significant ( $P < 0.01$ ) effect on egg weight both at ASM and at 40 weeks of age. The genetic group had highly significant ( $P < 0.01$ ) effect on body weight at the sexual maturity. Vanaraja was found to be significantly heavier than its crosses with Desi chicken native to Bihar. The analysis of variance revealed highly significant ( $P < 0.01$ ) effect of genetic group on egg length, egg width and shell thickness. Vanaraja laid the lengthier and wider eggs than its crosses with Desi chicken of Bihar. There was no significant difference between the genetic group for shape index. Egg laid by Vanaraja had significantly ( $P < 0.05$ ) thicker egg shell than the eggs laid by its crosses with the Desi chicken. The genetic group was found to have significant ( $P < 0.05$ ) effect on albumen height, albumen index, yolk height and yolk index. Eggs laid by Vanaraja had significantly ( $P < 0.05$ ) thicker albumen and egg yolk than its crosses with the Desi chicken. The genetic groups had significant ( $P < 0.05$ ) influence on albumen weight, yolk weight and shell weight. Eggs laid by Vanaraja had significantly ( $P < 0.05$ ) higher albumen weight, yolk weight and shell weight as compared to its crosses with the Desi chicken. The VN  $\times$  VN had significantly ( $P < 0.05$ ) higher percentage of albumen, egg yolk and shell weight as compared to Muz Desi  $\times$  VN and Gaya Desi  $\times$  VN genetic groups. The egg weight group had significant ( $P < 0.01$ ) influence on egg length, egg width and shell thickness. The eggs of 55 g and above groups had significantly ( $P < 0.05$ ) lengthier and wider eggs and thicker shell than the eggs of 34-40, 41-47 and 48-54g egg weight groups. The egg weight was found to have, in general, highly significant ( $P < 0.01$ ) and positive phenotypic correlation with all the egg quality traits except with shape index and albumen index. The magnitudes of coefficient of phenotypic correlation were moderate to high. The coefficient of phenotypic correlation among the egg quality traits were, in general, positive, highly significant ( $P < 0.01$ ) and moderate to high in magnitude. Muz Desi  $\times$  VN produced large number of eggs as compared to VN $\times$ VN and Gaya Desi  $\times$  VN. The hen day egg production percentage between 36-40 weeks of age was higher in Muz Desi  $\times$  VN (42 percent) followed by VN $\times$ VN (38 percent) and Gaya Desi  $\times$  VN (39 percent). Muz Desi  $\times$  VN had the highest fertility percentage followed by VN $\times$ VN and Gaya Desi  $\times$  VN. On total number of eggs set basis, the Muz Desi  $\times$  VN was found to have the highest (76.54 percent) percentage of hatchability followed by Gaya Desi  $\times$  VN (74.16 percent) VN $\times$ VN (72.32 percent), whereas on the basis of fertile eggs set the VN $\times$ VN genetic group had the highest percentage (92.39 percent) of hatchability followed by Gaya Desi  $\times$  VN and Muz Desi  $\times$  VN.

**Animal Nutrition**

Name of student	: Dr. Jyoti Kumari	Degree	: M.V.Sc in Animal Nutrition
Father's name	: Sri Late Bharat Sao	OGPA	: 8.419
Address	: Flat No.-102, Binay Enclave, Janta Road, Gardanibagh, Patna-800001	College Name	: Bihar Veterinary College, Patna-14
Date of Birth	: 08.01.1990	Mobile NO.	: 8539894516
Category	: BC	Email Id	: Jyoti27bvcveru@gmail.com
Roll No.	: VP/BVC/ANN-01 /2013-14	Present Status	: -
Name of Advisor	: Dr. Sanjay Kumar		

***Thesis Title : To study the effect of different level of Azolla meal on nutrient utilization and growth performance in goat kids.***

**ABSTRACT**

Animal production is one of the important components of Indian agriculture and contributes significantly to the income of farmers. Availability of conventional feed to sustain livestock feeding is a major constraint in developing countries. Hence, pressure on utilization of alternative feed resources has been increasing to develop least cost rations. However, literature is available on the nutritional potential of azolla and their metabolites in ruminants. An attempt is made to assess nutritional potential of Azolla in a total mixed ration (TMR) at different dietary level on nutrient utilization and metabolic status of goats under hot humid agro climatic condition in Bihar. This study will give more information about the effective utilization alternative feed resources, which will help in developing feeding strategies for better utilization of nutrient from protein rich feeds by goats under Bihar condition. All the standard managemental practices were followed during experimental period.

Eighteen growing male kids of 3-4 months age with average body weight of  $5.72 \pm 0.88$  kg were distributed into three groups of six animals each on the basis of body weight in a randomized block design. The animals were fed graded level of Azolla meal (0, 20 and 40 %) mixed in concentrate mixture and green fodder berseem. In this study different parameter like feed intake, body weight gain, feed conversion ratio, digestibility of nutrient, blood bio-chemicals, serum biochemistry of Black Bengal goats (cross) were observed, respectively. This experiment was conducted for 90 days on 18 male kids.

The average body weight of the goats of T1 (control), T2 (20%, azolla meal) and T3 (40%, azolla meal) group were 10.68, 11.93 and 10.20kg, respectively. The total DMI (g/d) of T1, T2 and T3 group were 458.12, 449.54 and 494.66 respectively. The intake of DM in each group was comparable and so is the R:C ratio. However CP, DCP and TDN obtained is quite significant in T2 group than T1 and T3 group.

In present study protein rich feed azolla was fed at moderate level (20% of total DMI) which did not hamper voluntary feed intake in growing goats rather it improves the feed intake. The digestibility of other nutrients such as OM, NDF, ADF, CP, EE, CF, TA and NFE were numerically higher in T2 group lowest in T3 group inclusion which might be due to more inclusion of azolla i.e 40% azolla in concentrate mixture. From here it can be concluded that though azolla is protein rich but its inclusion in concentrate mixture is helpful only in moderate level to animals, as higher amount hampers digestibility of nutrients. The digestibility percentage of dry matter was from 58.16 in T3 to 63.15 in T2 group.

The N intake (g/d) was higher in T3 group as compared to T2 and T3 group which might be due to increased amount of azolla i.e (40% azolla) in T3 group, but data was significantly comparable ( $P>0.05$ ) among the groups. The N balance was higher in T3 group as compared to T2 and T1 group.

The final body weight was higher in T2 and lowest in T3 group as compared to control group. The body weight (kg) and average daily gain (g/d) was significantly higher ( $P>0.05$ ) in T2 as compared to T1 and T3 group. The ADG obtained was highest in T2 group (60.33 g/d) and lowest in T3 group (45.66 g/d). The total DMI by the animals of T2 group was higher than T3 and T1 groups, respectively. The FCR in T2 (20% azolla meal) supplemented group was lower than T3 (40% azolla) and T1 group. The body weight changes observed at sixth fortnight was significant in T2 group (20% azolla meal). The weight gained after sixth fortnight was significantly higher in T2 group, i.e (5.73 to 11.16 kg) in T2 group, (5.76 to 10.29 kg) in T1 group and (5.66 to 9.77 kg) in T3 group.

The feeding of azolla meal up to 20% level in total DMI did not affect the haemoglobin level and it was fall within the normal range. There was no significant difference ( $P>0.05$ ) among various treatment group was noted; however, numerical value of PCV in T2 group was higher than T3 and T1 group. The MCV, MCH and MCHC value were also numerically higher in T2 group as compared to T1 and T3 group. The neutrophil count was significantly higher ( $P<0.05$ ) in T2 group as compared to control and T3 groups. The lymphocyte count was significantly higher ( $P>0.04$ ) in T2 group as compared to control and T3 groups. The increase in lymphocyte count in T2 group reflect towards higher immunity of animals and it might be due to the presence of secondary metabolites in azolla meal had synergistic effect on metabolism. However, monocyte, eosinophil and basophil count were numerically higher in T2 group as compared with control group.

The total glucose level was significantly differed ( $P>0.05$ ) among the treatment groups as compared to control. 20% azolla meal supplemented group had higher glucose level as compared to T1 and T3 group. The total protein level in blood serum was higher in T2 group as compared to T1 and T3 group. The increase in serum total protein level indicates the more nitrogen availability at tissue level in T2 group as compared to T1 and T3 group. albumin and globulin level was higher in T2 group as compared to T1 and T3 group. The serum urea level was significantly not differed ( $P>0.05$ ) among the treatment groups as compared to control. However, the urea level was lower in T2 and T3 group as compared to control. The BUN level was lower in T2 group as compared to control. The decrease in BUN reflected good dietary protein metabolism happened in animals supplemented with azolla meal. However, the uric acid level was not significant among groups. The serum creatinine level was significantly lower ( $P<0.05$ ) in T3 group as compared to control. Creatinine is a waste molecule that is generated from protein metabolism. Reduction in creatinine indicates retarded catabolism rate in treatment group animals.

The serum SGOT level was significantly not differed ( $P>0.05$ ) in treatment group as compared to control. However, azolla meal supplementation did not affect liver metabolic function of the treatment group animals so, that liver function enzymes showed unchanged pattern. The serum



SGPT level is higher in T2 and T3 group as compared to control group. The present study indicated that azolla meal supplemented group showed higher ALP level in T2 and T3 groups as compared to control.

The serum cholesterol level was significantly not differed ( $P>0.05$ ) in treatment group as compared to control. However, there was slight reduction in total serum cholesterol level by in treatment group as compared to control. The serum triglyceride level was higher in T2 and T3 group as compared to control. In present study the good quality cholesterol level was not affected by supplementing azolla meal in goats and found comparable data among the treatment. The serum LDL level was significantly not affected ( $P>0.05$ ) with supplementation of azolla meal as compared to control. This indicate that supplementation of azolla meal had no any adverse effect on serum lipid profile in goats.

As far as economics of production is concerned, total feed cost of T1, T2 and T3 are Rs.614.06, Rs.635.00 and Rs.599.55 respectively. Initial body weight(kg) of goat of T1,T2 and T3 are 5.76, 5.73 and 5.66 respectively and Net body weight(kg) gain of goat of T1, T2 and T3 are 4.54,5.48 and 4.12 respectively.Thus Cost of production/kg body weight(Rs.) are 135.37,115.87 and 145.50 respectively. Hence economically also (20% azolla) is beneficial.

The feeding of protein rich feed (azolla meal) resulted in improved growth performance and FCR without affecting the nutrient metabolism of goats.The metabolic status of goat was improved and remarkable reduction in cost of production/kg body weight (Rs.), which is beneficial to farmers

**Animal Reproduction Gynaecology and Obstetrics**

Name of student	: Dr. Bhawesh Kumar	Degree	: M.V.Sc in Veterinary Gynecology & Obsterics
Father's name	: Sri Ram Balak Choudhary	OGPA	: 8.419
Address	: VIP Colony, PO- Singsarai, Distt.- Samastipur, Bihar, Pin- 848114	College Name	: Bihar Veterinary College, Patna-14
Date of Birth	: 28.12.1983	Mobile NO.	: 8507750091
Category	: General	Email Id	: Kumarbhawesh0711@gmail.com
Roll No.	: VP/BVC/VGO-01 /2014-15	Present Status	: Working in PDP (Sudha Dairy)
Name of Advisor	: Dr. D. Sen Gupta		

***Thesis Title : Strategic Reduction in blood cortisol level and progesterone priming in the Treatment of poor Reproductive performance in heat Stressed Buffaloes***

**ABSTRACT**

There is a great economic loss to a farmer caused by subdued behavioural estrus due to heat stress. The present study was conducted on 120 buffaloes in the summer months of Patna area. From this present study it was found that although buffalo is not a season breeder but it behaves like season breeder because of its susceptibility to heat stress. Its body coat colour, sparse hairs & less no. of sweat gland make it more susceptible to heat stress which leads to subdued estrus, silent heat, anaestrus & repeat breeding. It was found that in heat stress, blood cortisol level increases leading to adverse effect on hypothalamus pituitary-gonad axis and impair folliculogenesis. More recently blood cortisol level has been identified as one of the important markers of heat-stress in animal, the level being significantly elevated in animals subjected to heat stress. The present study was done to ameliorate the heat stressed buffalo through the strategic reduction of blood cortisol level & aided by progesterone priming.

From the findings of experiments, it can be proclaimed that the mitigating effect of high blood cortisol level on the intensity of heat can be ameliorated effectively by supplementation of gluconeogenic precursor to animals along with calcium, phosphorus and vitamin B complex supplementation which ensures effective utilization of glucose at the tissue level and not just the blood glucose level. Progesterone priming has been found to potentiate the effect of estrogen by increasing the sensitivity of the body. Progesterone priming and cortisol reduction either alone or in combination resulted in fast growth of follicles and onset of heat; however combination treatment had better result. The reduction in blood cortisol level and progesterone priming results in follicles with greater estrogen level with lower interval between the onset of heat and ovulation.

In our experiments, progesterone priming had significant effect on cellularity and ferning probably by increasing the sensitivity to estrogen. Progesterone priming and reduction of cortisol with

glycerol and vitamin administration had no effect on bellowing, mucus discharge and vulvar redness, however affected cellularity and ferning characteristics. Thus among various signs of estrus, vulvar redness, ferning and cervical mucous cellularity are better indicators of heat rather than the bellowing and mucus discharge. Estrogen has pro-inflammatory influence on the reproductive tract in that it induces hyperemia, mucous discharge, swelling and redness; cortisol is known for its anti-inflammatory properties. Thus the mitigating effect of cortisol on the intensity of heat as has been found in this study might be due to its anti-inflammatory properties. Progesterone priming, estrogen administration and cortisol level did not affect bellowing and mucus discharge at heat of buffaloes indicating that these two characters are independent of hormone levels beyond the threshold required for the onset of heat.

Synthetic GnRH analogue buserelin acetate is well known to induce the onset of folliculogenesis within two days of administration. Administration of buserelin acetate at the time of CIDR insertion resulted in the presence of mature follicles at the time of CIDR removal while buserelin administration on the day of CIDR removal resulting in onset of folliculogenesis after two days indicating that presence of mature follicles close to the end to progesterone priming results in follicles with greater estrogen content, shorter ovulation time and better heat symptoms. As the time of heat is delayed from the end of progesterone priming it results in poor secondary symptoms of heat and delayed ovulation. Best conception rate was found with progesterone priming with buserelin acetate at the time.

**Veterinary Public Health**

Name of student	: Dr. Alok Kumar	Degree	: M.V.Sc in Veterinary Public Health
Father's name	: Sri Ram Narayan Sharma	OGPA	: 8.524
Address	: H-1161, Magadh Colony, Chandauti More Road No-2, Gaya-823001, Bihar	College Name	: Bihar Veterinary College, Patna-14
Date of Birth	: 11.01.1987	Mobile NO.	: 9430058863
Category	: General	Email Id	: Vetlok52@gmail.com
Roll No.	: VP/BVC/VPE-01 /2014-15	Present Status	: Working in HR Foods Processing Pvt. Ltd., Barbigha
Name of Advisor	: Dr. P. Kaushik		

***Thesis Title : Epidemiological studies on the prevalence of Methicillin Resistant staphylococcus aureus in animals and man***

**ABSTRACT**

This study was aimed to evaluate the effect of different treatment protocols on post-partum uterine defense in cross-bred cows. The first experiment tested the effect of glycerol along with calcium and B- complex supplementation on the reduction of post-partum cortisol level. It was found that glycerol and B-complex administration had positive effect on lowering plasma cortisol level in post-partum cows. The second experiment tested the role of post-partum cortisol reduction, pre and post partum anti-oxidant (vitamin E & Se) administration, levamisole and PGF<sub>2</sub>? administration as immunostimulant on the bacterial load and PMN count of endometrial scraping. Though all of these treatments were excellent in the reduction of post-partum bacterial load best results were obtained by administration of PGF<sub>2</sub>? followed by levamisole in the reduction of post-partum bacterial load in the bovine uterus. The third experiment was conducted to test the efficacy of ecboic and antibiotics in the elimination of bacterial infection. Antibiotics were chosen based on culture and sensitivity test and compared with ceftiofur that has the reputation of reaching the minimum inhibitory concentration in the bovine uterus and is effective against both gram positive and negative aerobes as well as anaerobes. The result of this study revealed that ecboic administration during the post partum period has significant effect on the reduction of post-partum bacterial load by its flushing action and had synergistic action with ceftiofur. Culture sensitivity test of uterine lochia revealed that the bacteria was sensitive to ceftriaxone, levofloxacin and amikacin and among these ceftriaxone was the best in elimination of bacterial infection. The synergistic action of ecboic and antibiotics might be due to the reduction of size and weight of uterus by ecboic resulting into greater concentration in that organ. Further the better results with ceftriaxone compared to levofloxacin and amikacin in spite of having a bacterial

population sensitive to them might be due to the differences in the distribution of these antibiotics in the bovine uterus. Thus from this study it can be concluded that with the administration of pre and post partum vitamin E, selenium and B- complex preparation along with post-partum doses of PGF<sub>2</sub>, levamisole and ecbofic farmers can greatly reduce the incidences of metritis and pyometra.

Name of student	: Dr. Subhash Kumar	Degree	: M.V.Sc., Veterinary Gynecology & Obstetrics
Father's name	: Shri Dinesh Prasad Sah	OGPA	: 8.757
Address	: Shermari Bazar, Pirpainti, Bhagalpur, Pin- 813209	College Name	: Veterinary Gynecology & Obsterics, Bihar Veterinary College, Patna-14
Date of Birth	: 11.01.1987	Mobile NO.	: 9708000978
Category	: EBC	Email Id	: Mr.subhash1109@gmail.com
Roll No.	: VP/BVC/VGO-02/2014-15	Present Status	: Agriculture Officer, Punjab National Bank
Name of Advisor	: Dr. D. Sen Gupta		

***Thesis Title : Effect of Peripartureint oxidetive stiss and plasma cortision level on uterine defence in cross breed cow***

**ABSTRACT**

Methicillin resistant Staphylococcus aureus (MRSA) is one of the most prevalent and clinically significant pathogen of public health concern. The present study was performed to isolate and characterize MRSA from cattle, buffalo, dog and their handlers' with antibiogram profile determination.

By conventional method 45.59% of samples were found positive for methicillin resistance, of which 37.16% samples harbouring coagulase positive MRSA. The coagulase positive MRSA revealed a distribution of 27.14% in cattle, 28.79% in buffalo and 39.29% in their handler whereas, 51.52% in dog and 45.16% in their handler. The PCR study showed a distribution of mecA gene in 14.29%, 8.57%, 27.27%, 27.27%, 35.48%, 51.61%, 50.00%, 17.86% and 41.94% samples in cattle nose, cattle skin, buffalo nose, buffalo skin, dog nose, dog skin, dog wound, cattle/buffalo handlers' and dog handlers' respectively.

Antibiogram study of mecA+ve MRSA of cattle nasal revealed 100% resistance to penicillin and oxytetracycline while phenotypically positive MRSA to tetracycline. However, mecA+ve MRSA of cattle skin revealed 100% resistance to ceftiofur while phenotypically positive MRSA only 22.22%. Antibiogram study of mecA+ve MRSA of buffalo nasal revealed 77.77% resistance to penicillin whereas 88.89% phenotypically positive MRSA were sensitive to penicillin. However, mecA+ve MRSA of buffalo skin revealed 100% resistance to ceftiofur and penicillin whereas 100% phenotypically positive MRSA were sensitive to penicillin and resistant to tetracycline.

Antibiogram study of mecA+ve MRSA of dog nasal revealed that 100% isolates were resistant to penicillin whereas 75.00% phenotypically positive MRSA were sensitive to penicillin. However, mecA+ve MRSA of dog skin showed 100% resistance to penicillin whereas 100% phenotypically positive MRSA were sensitive to penicillin.

Antibiogram study of mecA+ve MRSA isolates of dog wound revealed 100% resistance to amoxyclav, ofloxacin, ceftiofur, ceftriaxone, penicillin, oxytetracycline, co-trimoxazole whereas 100% phenotypically positive MRSA were resistant to clindamycin, gentamicin and oxytetracycline.

Antibiogram study of mecA+ve MRSA of cattle and buffalo handler revealed 100% resistance to penicillin and oxytetracycline whereas 87.50% and 12.50% phenotypically positive MRSA were resistant to oxytetracycline and penicillin, respectively. However, mecA+ve MRSA of dog handler revealed 92.31% resistance to penicillin while 100% phenotypically positive MRSA were sensitive to penicillin.

Thus from the present study it can be concluded that MRSA is widely prevalent in animals and their handler which may pose a risk of public health concern. The current study also showed a high level multidrug resistance among MRSA. From this study, it could be stated that mecA gene harbouring MRSA were highly resistant to penicillin while phenotypically MRSA positive were highly sensitive to that. The resistance patterns founded in this study posse an alarming condition for future use of antibiotics to treat both animals and man.

**Livestock Production Management**

Name of student	: Sanjeev Kr. Singh	Degree	: M.V.Sc., Livestock Production Management
Father's name	: Shri Awadesh Kr. Singh	OGPA	: 8.385
Address	: Vill+P.O.- Mahamada, Via- Vasantpur, P.S. Bhagwanpur Hat Siwan-841406	College Name	: Bihar Veterinary College, Patna-14
Date of Birth	: 08.11.1985	Mobile NO.	: 9430810875
Category	: General	Email Id	: -
Roll No.	: M/LPM/219/BVC/2014-15	Present Status	: -
Name of Advisor	: Dr. S.P. Sahu		

***Thesis Title : Study the effect of feed additive on performance of broiler chicken***

**ABSTRACT**

Broiler production in India is rapidly increasing to combat the need of animal protein for human population due to high prices and shrinking supply of mutton and other animal protein sources. Broilers are one of the most efficient converters in the whole animal industry both with respect to economical and nutritional point of view. Recent trend raising of broilers is to find out new method to increase the rate of growth in broiler, gauged in terms of body weight at a particular age. The main objective of economical rearing of broilers is to minimize alarming farm inputs and maximize the output. Feeding cost alone consumes about 70% of farm budgets which calls for skill feeding on scientific line. Hence formulation of cost effective ration for the broilers is the great concern of broiler farmers. Besides other factors a proper balance of the intestinal microbial flora has been of paramount importance for the efficient utilization of nutrients from available feed resources. A delicate relationship between the beneficial and pathogenic bacteria in the digestive tract is necessary for life and good health.

Thus for the maximum utilization of feed resources optimally and to counteract the stresses various growth promoters are being used to obtain maximum feed efficiency in shortest possible time for proper utilization of nutrients optimum balance in indigenous microbial population must be maintained. Among various growth promoters, probiotics received greater attention. It has been acclaimed to stimulate the growth and improves the feed efficiency of birds by favouring colonization with a specific groups of beneficial microorganism create an environment biased against undesirable organisms.

However the use of probiotics in broiler diet has revealed conflicting reports concerning growth performance like feed efficiency total weight gains and health conditions under different situations. Probiotics has to face several barriers like gastric juice competitive inhibition by pathogenic bacteria which affects the viability of probiotic in gastrointestinal tract. Hence and alternative



vitamin and mineral has been introduced by scientist all over world. Thus in order to study the effect of supplementation vitamin, mineral and probiotic and their combination in commercial broiler diet, on the performance of broilers, a feeding and balance trial of 200 day old- chicks of commercial strain for a period of six weeks was conducted. Commercial broiler diets, both starter and finisher, supplied by M/sAmrit Feed Ltd., Hajipur were used in the experiment. 200 day-old commercial broiler chicks were procured from market and were randomly divided in to 8 groups containing 25 chicks in each group as following treatments: T1(control group), T2 (Basal diet with recommended dose @ 25 gmSupplivitper quintal of feed), T3 (Basal diet with recommended dose @ 1 kg Agrimin per quintal of feed), T4 (Basal diet with recommended dose @ 50 g Biovet- YC (probiotic) per quintal of feed), T5 (Basal diet with recommended dose @ 25 g Supplivitpremix and 1 kg Agrimin per quintal of feed), T6 (Basal diet with recommended dose @ 1kg Agrimin and 50 g Biovet- YC (probiotic) per quintal of feed), T7 (Basal diet with recommended dose @ 25 g Supplivitpremix (vitamin) and 50g Biovet- YC (Probiotic) per quintal of feed) and T8 (Basal diet with recommended dose @ 25 g Supplivitpremix (vitamin), 1 kg Agrimin and 50g Biovet- YC (Probiotic) per quintal of feed).

There was significant difference in average body weight of chicks among treatment groups at the end of first and six week of age. Chicks fed diet without vitamin, mineral, probiotic and their combination (T1) reflected significantly lower body weight than all supplemented groups (T2, T3, T4, T5, T6, T7 and T8). The probiotic along with vitamin and mineral supplemented groups (T8) in general showed significantly ( $P<0.05$ ) higher body weight gains than the unsupplemented group (T1).

The higher body weights were observed in T8 than the other supplementation groups. Further, the overall results of average weekly body weight indicated that the ration in which probiotic with vitamin and mineral combination showed improvement in average weekly body weight significantly ( $P<0.05$ ) than the diet without any supplementation (T1) at first, third, fourth and sixth week of age. The result of this study indicated that inclusion of vitamin, mineral and probiotic in rations had influence on average weekly body weight of broiler. Chicks in all fed supplemented group significantly exhibit a higher body weight in all treatment group.

The average body weight gain of chicks at the end six week of age among the groups T1,T2, T3, T4, T5, T6, T7 and T8 were  $332.83\pm 1.61$ ,  $327.92\pm 1.88$ ,  $344.64\pm 1.75$ ,  $369.46\pm 2.33$ ,  $387.54\pm 1.85$ ,  $390.74\pm 1.96$ ,  $380.58\pm 1.97$  and  $391.72\pm 1.54$  g; respectively. Statistical analysis of weekly body weight gain data revealed that dietary inclusion of vitamin, mineral and probiotic had significant ( $P<0.05$ ) effect only at third and fourth week of age. Further, the overall results of body weight gains indicated that the ration in which combination of vitamin, mineral and probiotic were supplemented (T8) showed improvement in body in body weight gain significantly ( $P<0.05$ ) than that diet without any supplemented (T1) during third and fourth week of age only during experimental period. At third week of age, the birds maintained on combination of vitamin, mineral and probiotic diet (T8), diet supplemented with other treatment group means T2, T3, T4, T5, T6, and T7 ; had significantly higher body weight gain than the birds maintained on control diet.

Similarly, at 4th week of age birds fed with vitamin and mineral supplemented diet (T5) significantly gained more weight ( $382.76\pm 1.80$ ). The average body weight gain during fourth week of experimentation ranged from  $299.47\pm 1.72$  g to  $382.76\pm 1.80$  g and was significantly ( $P<0.05$ ) influenced by dietary treatments. The patterns of improvement in weight gain of chicks were almost similar as was observed in third week of growth. The average body weight gain during six week of age were ranged from  $332.83\pm 1.61$  g to  $391.72\pm 1.54$  g and was significant ( $P<0.05$ )

influenced by dietary treatments. Combination of vitamin, mineral and probiotic incorporated group (T8) showed the higher body weight gain than the chicks fed with vitamin, mineral and probiotic supplemented groups (T2, T3, T4, T5, T6 and T7).

The present findings revealed that the response of feed additive alone and combination of feed additives reflected by change in body weight gain during growth period was significantly better than that of control in this system of management in poultry. The perusal of results pertaining to growth rate revealed that the diet supplemented with feed additives and their combination of feed additives resulted in better growth efficiency in broiler chicks.

Data on feed intake at different weekly intervals as influenced by dietary inclusion of vitamin, mineral and probiotic revealed that this traits was not statistically different among different treatments except in third and fourth week of age. Chicks in different groups showed significant effect of treatment on feed intake as revealed by feed intake of T8 (709.74±8.82 g) than control group T1 (682.97±7.33 g). Similarly, the analysis of data on weekly feed intake of chicks during the fifth week of age indicate significant ( $P<0.05$ ) differences among the treatment groups. The chicks maintained on combination of vitamin, mineral and probiotic supplementation diet had significantly ( $P<0.05$ ) lower feed intake T8 (714.49±13.92 g) than T6 (792.88±12.17 g), T7 (798.82±11.95 g), T2 (802.13±13.51 g), T3 (814.58±13.77 g), T4 (857.42±11.84 g) and T5 (870.73±13.74 g) groups; respectively.

There was no significant difference in feed conversion ratio value in the chicks fed supplemented diet during the second, third, fourth and six week of age in treatments groups T1, T2, T3, T4, T5, T6, T7 and T8. Result of feed conversion ratio (FCR) indicates that there was improvement in the efficiency of feed utilization when the diets were supplemented with vitamin, mineral and probiotic.

The present finding revealed that probiotic, mineral and vitamin in combination or alone as feed additive had better impact on nutrient utilization and its conversion in to soft and hard body tissues as compared to control. In general the feed conversion ratio was better in the birds fed with feed additives as compared to control.

The variations in Drumstick length and non-edible percentage due to feed additives were non-significant. The effects of feed additives on other carcass traits such as dressed weight, Eviscerated weight, Giblet weight, Non edible weight, Shank length, Thigh length, keel length, Dressing, percentage, Giblet percentage were significant due to feed additives in different treatment groups.

Dressing percentage based on eviscerated weight was non-significantly higher in T1 (7632±1.29) followed by T5 (75.77±0.78), T4 (75.62±0.33), T8 (75.61±0.31), T6 (75.15±0.67), T7 (74.72±0.51), T2, (74.36±0.1.09) whereas T3 (73.84±1.50) was significantly lower.

The highest morality were found in T1 (control) 12% followed by T3& T4 (8%), T2, T5, T6& T7 (4%) groups; respectively. The mortality percentage of broiler reared with feed additives supplemented with vitamin, mineral and probiotic group (T8) found to be minimum.

The result of present study revealed that mortality percentage was less in the birds of treatments groups as compared to control. The lower mortality percentage might be due to addition of feed additives in the feed resulting in better growth, immunity and general health status of birds.

As for as total feed lowest in concerned the birds reared on basal diet with probiotic (T4) was maximum and birds reared on vitamin (T2) was minimum. Similarly medicine and additive cost was higher for T8 group and lesser for T1 group. Here, except control group, in order group of birds additive cost is more. After study of total expenditure on rearing different group of birds, it was

found that rearing expenditure was maximum in T3 group (2911.55) and minimum in T2 group (2636.31).

Further, cost of sold bird was maximum in T8 (vitamin + mineral + probiotic) group and it was minimum in T1 (control) group. It means birds with different type of supplementation groups well and their weight was more in comparison to control group. Simultaneously total income was maximum (Rs. 3569.50) in T8 group and minimum (Rs. 3015.50) in control group.

But, when we see the profit (Rs.) from rearing birds, it was maximum in T8 group (Rs. 685.09) and minimum (Rs. 347.85) in T1 group. As for as, profit/bird in concerned it shows the similar trend and it was maximum in T8 group and minimum in T3 group.

Based on the result obtained in the present study that by using non-antibiotic feed additive particularly mixing of both vitamin, mineral and probiotic at recommended dose have the potential to be applied as effective substitute for getting good economical return in the broiler farming.

**Horticulture(Olericulture)**

Name of student	: Jagdeep Chaurasiya	Degree	: Ph. D (Ag) in Horticulture(Olericulture)
Father's name	: Sri Ganga Prasad Charasiya	OGPA	: 8.212
Address	: Vill-Paschim Sarira, Dist-kaushambi,UP-212214		
	College Name	: BAC, Sabour	
Date of Birth	: 01/07/1991	Mobile NO.	: 8604188112
Category	: OBC	Email Id	: jdch143@gmail.com
Roll No.	: D/Hort./15/BAC/2013-14	Present Status	: Service in UP Govt. in the capacity of technical Assistant.
Name of Advisor	: Dr.R.B.Verma		

***Thesis Title : Effect of weed management practices on weed dynamics, growth, yield and quality of onion (Allium cepa L)***

**ABSTRACT**

Onion (*Allium cepa* L.) is an important commercial crop of family Amaryllidaceae. The productivity of crop is affected due to several factors in which weed infestation is the global problem and reduces the bulb yield to a tune of 40-80% depending on types of weed flora and their intensity. Besides having a shallow root system, onions are usually planted at very closer spacing, which possess a problem in weeding and increase the cost of cultivation. Under such surroundings, herbicides are the best alternatives which are economically feasible. With this in view the present experiment was conducted at vegetable research farm Bihar Agricultural University, Sabour during 2014-15 and 2015-16 to appraise the efficacy weed management practices on weed dynamics, crop growth, yield and quality of onion. The 16 treatments were evaluated in randomized block design with three replications. The results revealed that, the predominated weed species were *Cynodon dactylon* L., *Cyperus rotundus* L., *Eleusine indica* (L.) Gaerth, *Polypogon monspeliensis* (L.) Desf., *Phalaris minor* L., *Chenopodium album* L., *Tridax procumbens*, *Rumex occidentalis* L., *Digera muricata*, *Phyllanthus niruri* L., *Anagallis arvensis* L., *Argemone mexicana* L., *Fumaria parviflora* Lam., *Coronopus didymus*, *Melilotus* spp., *Parthenium hysterophorus* L. The lowest weed population, their fresh and dry weight of weeds, weed index and N P K uptake by weeds and highest weed control efficiency and also all the growth and yield characters viz., plant height, No. of leaves per plant, fresh and dry weight of plant, average bulb weight, neck thickness, polar and equatorial diameter of bulb and bulb yield were observed higher and equally effective under treatments T15 (weed free check), T12 (PRE-Oxyfluorfen @ 250 g a.i. ha<sup>-1</sup> + one hand weeding at 35 DAT) followed by treatment T6 (PRE-Oxyfluorfen @ 250g a.i. ha<sup>-1</sup>+ Oxyfluorfen @ 250g a.i. ha<sup>-1</sup> at 35 DAT) and T10 (PRE-Pendimethalin @1000 g a.i. ha<sup>-1</sup>+ Oxyfluorfen @ 250g a.i. ha<sup>-1</sup>at 35 DAT). The quality parameters viz; total soluble solids (TSS %) Total sugar (g 100 g<sup>-1</sup>) and dry matter content of bulb (%) were not influenced by the different treatments of weed management. Highest benefit: cost ratio (2.20) was recorded under treatment T6 (PRE-Oxyfluorfen @ 250g a.i. ha<sup>-1</sup>+ Oxyfluorfen @ 250g a.i. ha<sup>-1</sup> at 35 DAT) with net returns of Rs. 180793.00 ha<sup>-1</sup> followed by 2.19 B: C ratio under treatment T12 (PRE-Oxyfluorfen @ 250 g a.i. ha<sup>-1</sup> + one hand weeding at 35 DAT) with net return of Rs. 195075.00 ha<sup>-1</sup>.

**Horticulture(pomology)**

Name of student	: PiyushShrivastava	Degree	: Ph.D. in Horticulture(pomology)
Father's name	: Sri VeerendraShrivastava	OGPA	: 7.839
Address	: Vill. & P.O- Akodhiya, Distt. Raebarely, U.P. Pin-229404	College Name	BAC, Sabour
Date of Birth	: 25.06.1987	Mobile NO.	: 8409577700
Category	: General	Email Id	: Piyush.prinshu@gmail.com
Roll No.	: D. Hort./018/BAC/2013-14	Present Status	:
Name of Advisor	M. Feza Ahmad		

***Thesis Title : Evaluation of different banana genotypes for pomological characters and resistance against Fusarium wilt using molecular marker***

**ABSTRACT**

This experiment has been conducted to study the genetic variability based on morphological and pomological characteristics of banana and phylogenetic analysis of various banana genotypes based on molecular markers against the Fusarium wilt during the year 2014-2016. As many as 28 genotypes viz. FHIA-23, Dwarf Cavendish, Gandevi Selection, Grand Naine, Jahaji, Lalkel, Robusta, Alpan, Bareli China, China, China Ratwara, Doodhsagar, Kalibel, Marthman, Marthman Nemopur, Marthman Simra, Malbhog Barhari, Panchanan, Poovan, Rasthali, Bersain, Kanchkel, Kanthali, Kothia, Lambee, Panchabantha Battisa, Udhayam and Saba-8 were collected from R.A.U., Pusa for this study. Wide variation was found among different morphological as well as biochemical parameters like plant height (186.33-335.78 cm), girth (46.67-70.67 cm), number of leaves at shooting (9.67-16.76), leaf area (7.47-17.78 m<sup>2</sup>), duration from planting to shooting (266.17-343.0 days), duration from shooting to harvesting (109.60-135.16 days), bunch weight (8.75 - 21.25 kg), number of fingers per hand (9.16-15.33), number of fingers per bunch (80.78 - 147.03), fruit length (7.83-16.0 cm), fruit width (3.56-6.60 cm), fruit weight (72.35 - 214.17 g), peel thickness (1.07-3.58 mm), pulp: peel ratio (2.05 - 3.22), TSS (15.71-23.04 oBrix), acidity (0.339-0.419 %), total sugar (12.75- 18.43 %), starch (4.34-13.59 %), total phenol (13.67 - 36.80mg CE/100g), total flavonoids (0.0.87 - 4.39 mg CE/100 g), total antioxidant (0.76-4.04 micromole TE/g), ascorbic acid (10.3-25.0 mg/100g), Total carotenoids (2.06-4.80 mg/100g), dry matter content (19.49-25.31 %), potassium content (287.67-428.55 ppm) and calcium content (3.58-9.82 ppm). Significant genetic variability was found among the genotypes with respect to morphological and biochemical characters thus there is an ample scope for selection of promising genotypes. High heritability estimates for plant height, girth, bunch weight, no. of fingers per bunch, fruit length, fruit weight, peel thickness, starch content, total phenol, total flavonoids, ascorbic acid, total carotenoids, total antioxidant, potassium and calcium content which indicates that the traits under study had

great scope for genetic improvement. Under screening of genotypes against Fusarium wilt based on rhizome discoloration index Grande Naine, Bersain, Poovan and Kanchkel were found to be resistant among all studied genotypes. The photosynthesis rate ( $\mu\text{mol}/\text{m}^2/\text{sec}$ ), stomatal conductance ( $\mu\text{mol}/\text{m}^2/\text{sec}$ ), internal CO<sub>2</sub> concentration of leaf (ppm), transpiration rate ( $\mu\text{mol}/\text{m}^2/\text{sec}$ ) and relative water content of leaf showed decline in inoculated plants as compared to non-inoculated plants among most of the susceptible and tolerant genotypes however less decline and in few cases even increase was found in resistance genotypes. Along with this, the phenolics content in roots of resistant plants were also higher as compared to tolerant and susceptible plants. The genetic similarity coefficients obtained with RAPD markers ranged from 0.474 (between the genotypes Panchanan and Udhyam) to 0.961 (between Grand Naine and Gandevi Selection). Based on this, the obtained dendrogram divided all the genotypes in two clusters having 12 and 16 genotypes. Primer OPA3 produced a specific band, which was present in Fusarium wilt susceptible genotypes. Therefore, this primer can be used further in such type of studies to detect genotypes susceptible to Fusarium wilt. Overall, in this experiment among all genotypes like Grand Naine, Kanchkel and Bersain were found to be high yielder along with resistance against Fusarium wilt whereas Malbhog Barahari, Chiniya, Chiniya Ratwara were found to be better in terms of biochemical parameters however these were susceptible to Fusarium wilt which shows that under Bihar conditions cultivation of genotypes like Grand Naine, Kanchkel and Bersain may prove much beneficial to growers.

**Livestock Production Management**

Name of student : Dr. Ravi Shankar Deo Barman Degree : Ph.D. in Livestock Production Management

Father's name : Sri Ram Pyare Prasad OGPA : 8.407

Address : Vill. + PO- Salempur,  
PS-Karay Par Saray,  
Distt.- Nalanda, Bihar,  
Pin- 801304 College Name : Bihar Veterinary College,  
Patna-14

Date of Birth : 25.01.1980 Mobile NO. : 8092147196

Category : BC Email Id : Barman.ravi@rediffmail.com

Roll No. : VP/BVC/Ph.D./ LPM -01 /2013-14 Present Status : Research Associate in NDRI

Name of Advisor : Dr. Mani kant choudhary

***Thesis Title : Studies on the effect of different shade material on performance of Buffalo calf***

**ABSTRACT**

The present study was conducted at ILFC (Instructional livestock farm complex), Bihar veterinary college, Patna. Buffalo calves were utilized for experiment. Twenty four Buffalo calf were taken after colostrum feeding (6calf in each group) with the objective of Studies on the effect of different shade materials on the performance of buffalo calves. The whole year was divided in to three seasons according to the ambient temperature and relative humidity: viz winter, summer and rainy. There are four type of roofing material was used like Asbestos roof (T1), Pre painted CGI Sheet roof (T2), Thatch with polythene shading roof (T3), Galvanized iron sheet roof (T4)- four inch thick layer of paddy straw fixed to bamboo frame. The following parameter was studied. Temperature, Relative humidity (RH), Temperature Humidity Index (THI), Surface temperature (ST) of roof, , Body measurement (body height, body length, heart girth and pouch girth), Physiological Variables (rectal temp and respiratory rate) Haematological, biochemical and serum enzymatic estimation and some behaviour like, feeding, watering, rumination, near water tub, resting, standing, sleeping, resting , moving , grooming, licking, cross licking) were studied.

In winter management different finding were obtained as fallow:

Maximum and minimum temperature both were comparatively higher in T3 (20.62±0.290C & 11.50±0.560C) group as compared to other groups. The RH at 9:00AM and 2:00PM was significantly lower (P<0.05) in T3 (72.02 ± 1.70 & 79.24 ± 0.70) in all other groups. The minimum THI (P<0.05) was in T3 (68.77±0.79) and maximum (P<0.05) was in T4 (71.29±0.60) followed by T2 (71.25±0.70) and T1 (69.88±0.77). Dry matter as concentrate (1.44±0.04) and dry fodder (0.99±0.09) were significantly higher (P<0.05) in T1 as compare other group. Whereas water intake (63.52±1.62 L/day) was significantly lower (P<0.05) in T3 as compared to other shade materials. ADG were found

to be maximum in T3 group ( $0.34 \pm 0.03$  kg) followed by T1 ( $0.21 \pm 0.02$  kg) as compared to T2 ( $0.18 \pm 0.02$  kg) and T4 ( $0.13 \pm 0.01$  kg). The body measurement viz. changes of body height, body length and pouch girth were more in T3 as compare to other group whereas pouch girth similar in T1 and T3. The rectal temperature and respiration rates were non significant between group. The haemoglobin was significantly higher ( $P < 0.05$ ) in T4 ( $10.25 \pm 0.49$  g/dl), followed by T1 ( $9.92 \pm 0.45$  g/dl). Whereas non significant difference between T2 ( $9.33 \pm 0.43$  g/dl) and T3 ( $9.33 \pm 0.43$  g/dl).

In summer management different finding were obtained as follow:

Maximum and minimum temperature both were lower in T3 ( $33.35 \pm 0.410C$  &  $23.44 \pm 0.260C$ ) group as compared to other groups. The RH at 9:00AM and 2:00PM was significantly higher ( $P < 0.05$ ) in T4 ( $77.20 \pm 1.38$  &  $67.27 \pm 1.86$ ) followed by T2 ( $76.54 \pm 1.65$  &  $65.96 \pm 1.18$ ) and T1 ( $74.55 \pm 1.98$  &  $61.57$ ) least in T3 ( $63.88 \pm 1.45$  &  $50.77 \pm 2.11$ ). The minimum THI ( $P < 0.05$ ) was in T3 ( $76.81 \pm 0.95$ ) and maximum ( $P < 0.05$ ) was in T2 ( $79.40 \pm 0.86$ ) followed by T4 ( $78.79 \pm 0.99$ ) and T1 ( $77.57 \pm 0.96$ ). Dry matter as concentrate ( $1.68 \pm 0.02$ ) and dry fodder ( $1.46 \pm 0.01$ ) were significantly higher ( $P < 0.05$ ) in T1 as compare other group. Whereas water intake ( $65.36 \pm 1.86$  L/day) was significantly lower ( $P < 0.05$ ) in T3 as compared to other shade materials. ADG were found to be maximum in T3 group ( $0.28 \pm 0.02$  kg) followed by T1 ( $0.18 \pm 0.01$  kg) as compared to T2 ( $0.14 \pm 0.01$  kg) and T4 ( $0.14 \pm 0.01$  kg). The body measurement viz. changes of body height, body length, heart girth and pouch girth were more in T3 as compare to other group. The rise in rectal temperature and respiration rates was significantly lower ( $P < 0.05$ ) in T3 as compared to other group. In rainy management different finding were obtained as follow.

Both at 9:00 AM and 2:00 PM T3 showed lowest temperature and differ significantly ( $P < 0.05$ ) with other groups. The RH was found to be maximum ( $P < 0.05$ ) in T3 followed by T1 and was less in T4 both at 9:00AM and 2:00PM. THI was found to be significantly more ( $P < 0.05$ ) in T4 followed by T2 and was least in T3. Significantly higher ( $P < 0.05$ ) dry matter intake (concentrate and dry fodder) in T1 and average daily gain in T3 as compared to other groups. The body measurement viz. changes of body height, body length, heart girth and pouch girth were more in T3 as compare to other group. Feed conversion efficiency (FCR) low in T3 as compare to others groups. The rise in rectal temperature and respiration rates was significantly lower in T3 as compared to other group. Haemoglobin of grouped calves T3 had significantly ( $P < 0.05$ ) more as compared to T1 and T2.

During summer season provision of thatch roof shade materials provide favorable micro-environment to the buffalo calves by improving the growth and keeping physiological, biochemical and behavioral response in normal range. During rainy season provision of thatch roof followed by asbestos had favorable impact on the growth, physiological, biochemical and behavioral response of buffalo calves. During winter provision of thatch roof material followed by asbestos and pre-painted GCI sheet roof had better impact on growth, physiological, biochemical and behavioral response of buffalo calves.