Department of Crop Physiology at a Glance

❑ Teaching

Faculty(Inception of the Dept.-1978,MSc-1983& PhD-1986		Degree awarded- 125
1. Dr. A.H. Khan , Ex. HOD	2. Dr. A.K. Singh , Incharge	PhD - 46
3. Dr. R.K Yadav, Assitt Prof.	4. Dr. V.N. Singh , Rice Breeder	PG - 79

❑ Research

Project Completed	On Going Project
International : 05	International : 02
National : 09	National : Nil

❑ ICAR Recognized as a CAS /CAFT in 1995

Training Orgenized	Participants	States
26	497	21

❑ Physiological traits identified

➢ Post-submergence physiological markers associated with injury and tolerance

- ❖Higher carbohydrates of rice seedling minimize the detrimental effect of submergence
- ❖Moderate shoot elongation is desirable trait for submergence tolerance under flash flooding.
- ❖Tolerant varieties show minimum increase in malondialdehyde content.
- ❖Tolerant varieties show higher increase in oxygen scavenging enzymes (SOD, Catalase and Peroxidase).

➢Physiological Markers/ Traits Validated for Salinity Tolerance

- ❖ Salt tolerant varieties having less Na and high K in leaves
- ❖ Salt tolerant varieties having higher Ca content in leaves
- ❖ Tolerant varieties showed higher increase in oxygen scavenging enzymes (SOD, Catalase and Peroxidase) than intolerant.

Research Work (2015- onwards)

Dr. A.H.Khan, Assoc.Professor (Feb.2009- Nov.2017)

HOD, Director CAFT & Member of Steering Committee of STRASA Project

Name of Project with Funding Agency:

- Site Co-ordinator: Stress Tolerant Rice for Poor Farmers in Africa & South Asia (STRASA)-3rdPhase-Bill Gate & Millenda Gate Foundation
- EC-IFAD (Salinity & Submergence), IRRI
- Project Submitted: Nil
- Publications: 09 (Referred Journal) **NAAS Rating: 3.03 to 11.29**
- **Recommendation: Seed priming in 1% KNO3 and 1% KCl for24 hours of rice seed was found very effective in enhancing rice yield up to 9-12 % than seed primed in ordinary water. This result was also demonstrated at farmers field under Ec-IFAD programme of IRRI.**
- **WORK PLAN: Characterization and evaluation of rice genotypes against stress tolerance (submergence, sodicity and drought)**

Teaching Work (2015 onwards)

Semester	Name of the course	Credit hours	Credit load
I st 2015-16	CP-511 : Principles of Plant Physiology-1 Cell organelles, Water relation and mineral nutrition	4(3+1)	2.0
	CP-512:Principles of Plant Physiology-2 Metabolism Processes and growth regulation	3(2+1)	1.5
	CP-611: Plant nutrition and metabolism	3(2+1)	1.5
	CP-613: Physiological and biochemistry of growth regulators	3(2+1)	1.5
	CP-615: Advances in photosynthesis and respiration	3(2+1)	1.5
	Total	**16(11+5)**	**8.0**
2nd 2015-16	CP-521:Abiotic stress responses in plants	4(3+1)	2.0
	CP-522: Plant growth regulators and plant development	3(2+1)	1.5
	CP-514: Physiological, molecular, Ecological aspects of photosynthesis and productivity	3(2+1)	1.5
	CP-621: Advances in stress physiology	3(2+1)	1.5
	CP-591: Seminar	1(0+1)	0.5
	CP-691: Seminar	2(0+2)	2.0
	Total	**16(9+7)**	**9.0**
No. of Student Guided: M.Sc. (Ag.) : 03, Guiding: 0			
No. of Student Guided: Ph.D. Crop Physiology: **Degree awarded:04 , Thesis submitted; 02** **WORK PLAN:** Teaching of UG,PG and PhD. courses and supervision of research work of M.Sc. and PhD.students as advisor as well as member of advisory committee of various students			

Research Work (2015- onwards)

Dr. A.K. Singh (Officer-Incharge)

Name of Project with Funding Agency:

- **PI: Physiology of Submergence Tolerance (STRASA Project)-3rd Phase-Bill Gate & Millenda Gate Foundation**
- **EC-IFAD (Submergence): Development of nutrient management options for sub1 rice varieties.**
- **QTL to variety –DBT funded project (2013-15)**
- **Project Submitted: Centre of Excellence for rice (Proposal Submitted to UP Govt. on dated 5th May 2017, release of budget awaited)**
- **Publications: 14**

Recommendation:

- **Do not apply urea in the seedbed or as basal fertilizer; rice plants which contain a lot of N die faster when submerged.**
- **Through SSR markers (RM 46 A & RM 219) we identified the four genotypes e i. Savita, NDR 9511, Sipulut Pandon & Katy having sub 1 loci**

WORK Plan: Studies on rice physiology and biochemistry under adverse condition for defining climate resilient rice cultivars.

- **Studies on comparative physiological response of wheat genotypes under terminal heat stress**

Teaching Work (2015 onwards)

Semester	Name of the course	Credit hours	Credit load
I st 2015-16	CP-211 (N): Crop Physiology	3(2+1)	1.5
	CP-514: Physiological , molecular, Ecological aspects of photosynthesis and productivity	3(2+1)	1.5
	CP-515: Mineral nutrition, Physiological and molecular aspects	3(2+1)	1.5
	CP-611: Plant nutrition and metabolism	3(2+1)	1.5
	CP-612: Advances in production physiology	3(2+1)	1.5
	Total Credit	**15(10+5)**	**8.0**
2nd 2015-16	CP-521:Abiotic stress responses in plants	4(3+1)	2.0
	CP-529: Experimental techniques in plant physiology	3(1+2)	1.5
	CP-621: Advances in stress physiology	3(2+1)	1.5
	CP-591: Seminar	1(0+1)	1.0
	CP-691: Seminar	2(0+2)	2.0
	Total credit	**13(6+7)**	**8.0**

No. of Student Guided: M.Sc. (Ag.) Crop Physiology : 05, Guiding: 10

No. of Student Guiding: Ph.D., Crop Physiology: 05(2* +2+1)

CAFT Training Organized: As course Co-ordinator: 02 (2015 to 2016), due to non accreditation further training was not organized although proposed trainings were uploaded on ICAR portal during 2016-17 & 2017-18.

Manuals and Updates: 02 in each year

Administration: AAO II, Nodal Officer, Leagal cell, Nirwachan , I.G.R.S & Member of other committees etc

Work Plan: Teaching of UG,PG and PhD. courses and supervision of research work of M.Sc. and PhD.students as advisor as well as member of advisory committee of various students

Research Work (2015- onwards)

Dr. R.K. Yadav , Assistant Professor Shodh Yojana (Non-Plan)

On going project: Sodh Yojana U.P.Govt.(NON-plan)

Project Submitted: Nil

Recommendation:

1. Basal application of different sources and level phosphorus in sodic soil increase growth and field of wheat crop. Among all the treatment basal application of 80 kg/ha DAP was found most effective as compare to SSP .
2. Foliar application gibberellic acid @ 100 ppm increase growth and yield of mustard. About 16% increase in yield was obtained with 100 ppm.
3. Foliar application (200 ppm) of growth regulators like GA_3 Salicylic acid were found to ameliorate the toxic effect of sodicity and increased tha yield of rice 15-20 % Results need further validation

Teaching Work (2015 onwards)

Semester	Name of the course	Credit hours	Credit load
I st 2015-16	CP-111(H) Introductory plant physiology	2(1+1)	1.0
	CP-211 Crop physiology	3(2+1)	1.5
	CP-511 Principles of plant physiology-1 Cell organelles, water relation and mineral nutrition	4(3+1)	2.0
	CP-512 Principles of plant physiology-2 Metabolic processes and growth regulation	3(2+1)	1.5
	CP-612 Advances in production physiology	3(2+1)	1.5
	CP-613 Physiology and biochemistry of growth regulators	3(2+1)	1.5
	Total Credit	**18(12+6)**	**9.0**
2nd 2015-16	CP-121(H) Growth and development of horticultural crops	2(1+1)	1.0
	CP-121(V) Fundamental of crop physiology	2(1+1)	1.0
	CP-522 Plant growth regulators and plant developments	3(2+1)	1.5
	CP-591: Seminar	1(0+1)	1.0
	Total Credit	**8(4+4)**	**4.5**
No. of Student Guided: M.Sc. (Ag.) : 03, No. of Student Guiding: M.Sc. (Ag.) : 06			
No. of Student Guiding: Ph.D., Crop Physiology**: NIL**			
WORK Plan: Teaching of UG,PG and PhD. courses and supervision of research work of M.Sc. and PhD.students as advisor as well as member of advisory committee of various students			

Research Work (2015- onwards)

Dr. V. N. Singh

Rice Breeder & PI: Shottle Breeding Network

DETAILS OF BREEDING LINES

Generation	No. of cross combination		SPS No.		Bulk No.	
	2016	2017	2016	2017	2016	2017
F0	3	4		-	-	-
F_1	4	3		-	-	-
F_2	6	5	35	35	5	5
F_3	9	9	48	40	6	8
F_4	8	6	75	35	4	10
F_5	7	7	60	25	3	12
F_6	6	4	55	36	2	9
Total	43	38	273	171	20	44

Recommendation: all the segregating materials will be further select and evaluate for future research; **Project submitted**: Nil, **Teaching:** Nil, **Publication**; 07

CAFT Achievements

S. No	Name of the training programm	Year	No. of trainees trained	Distribution of Trainees		
				Other institution	Host institution	No. of State
1.	Physiology of Field Crops and Production System in Present Scenario	2014-2015	14	10	04	06
2.	Importance of Plant Growth Regulators and Nutrients in Agriculture and Horticulture: Status and Prospective in Present Scenario	2015-2016	22	20	02	11
3.	Impacts of Drought and High Temperature Effects on Agriculture in Present Scenario	2016-2017	ADG(HRD) has approved the training programme. But did release the fund for training due to non accreditation of the university			
4.	Challenges and Management for Building Resilience in Crops against Heat andDrought	2017-2018	ADG(HRD) has approved the training programme. But did release the funds for training due to non accreditation of the university			