



**CENTRE OF ADVANCED FACULTY TRAINING
PLANT PATHOLOGY**
Govind Ballabh Pant University of Agriculture & Technology, Udham
Singh Nagar, Pantnagar-263145

Introduction :

The Department of Plant Pathology was created and accredited by the ICAR in 1961. Dr. Y. L. Nene was the first Head of the Department. The Department offers six U.G. and 34 P.G. courses. So far over 310 M.Sc. and 180 Ph.D. students have earned degrees from the Department. Over the years, the faculty and students have won over 40 national and international awards and have produced over 40 books published by the Indian and reputed international print-houses, besides many text books in Hindi, laboratory manuals, reference books, working sheets on diseases, bulletins, extension pamphlets, etc. The Department possesses a modern teaching and research infrastructure. Its Biocontrol laboratory is a notified referral lab by Central Insecticide Board, Govt. of India for quality testing of biopesticides. ICAR, in 1995, upgraded the department to the status of the Centre of Advanced Studies in Plant Pathology and, in 2009-10, further upgraded to Centre of Advanced Faculty Training. So far 24 trainings have been conducted wherein 498 trainees from 24 states have participated.

Objectives of CAFT

- To enhance the competence of the faculty to undertake advanced education, research and extension activities in the field of Plant Pathology.
- To update the curriculum and courses of Plant Pathology and to strengthen teaching at UG and PG level.
- To impart trainings to the faculty members/scientists in Plant Pathology of various SAU's and Research Institutes/Centres in the country.

- Create state of the art facilities in teaching, research and extension to address issues related to plant disease management through cutting-edge technologies.

Faculty

| Faculty | Area of specialization |
|--|---|
| <u>A. Professors</u> | |
| Dr. J. Kumar, Director, CAFT | Pathogen population characterization and genetics, molecular plant pathology, rice pathology, small farm disease management, IPM, Bio-control |
| Dr. H.S. Tripathi | Pulse Pathology, Phytovirology |
| Dr. R.P. Awasthi | Oilseed Pathology, Mycology |
| Dr. K.S. Dubey | Soybean Pathology |
| Dr. V.S. Pundhir | Vegetable Pathology, Forecasting and epidemiology of plant pathogens |
| Dr. (Mrs.) K. Vishunavat | Seed Pathology |
| Dr. Pradeep Kumar | Maize Pathology, Fruit Pathology |
| Dr. R.K. Sahu | Sugarcane Pathology |
| Dr. K.P. Singh | Forest Pathology and Diseases of Temperate fruits |
| <u>B. Associate Professors/SRO</u> | |
| Dr. Yogendra Singh | Sorghum Pathology, Bacteriology |
| Dr. R.P. Singh | Microbial Ecology, Fungicides and Vegetable Pathology |
| Dr. K.P.S. Kushwaha | Pulse Pathology, Mycology, Floriculture |
| Dr. A.K. Tewari | Oil Seed Pathology, Biological control |
| Dr. Vishwanath | Rice Pathology, Medicinal plants |
| Dr. Satya Kumar | Phytonematology |
| <u>C. Assistant Professors/JRO/SMS</u> | |
| Dr. (Mrs.) Deepshikha | Wheat Pathology |
| Dr. Bijender Kumar | Millet Pathology |
| Dr. (Mrs.) N. W. Zaidi (on EOL) | Subject Matter Specialist |
| <u>D. Honorary Professor</u> | |
| Dr. S.C. Saxena | Maize Pathology, Bacteriology |
| Dr. Sergey Savary | Epidemiology |
| <u>E. Emeritus Scientist</u> | |
| Dr. K.P. Singh | Wheat Pathology |

Human Resource Development

Training programme for HRD conducted during XI plan

| Sl. No. | Name of the Programme | Period | No. of Participants | | |
|---------|--|--------------------------------|---------------------|----------|-----------|
| | | | Internal | External | Total |
| 1 | Plant disease management on small farms | January 03-23, 2008 | 6 | 16 | 22 |
| 2 | Seed health management for better productivity | March 28 to April 17, 2008 | 6 | 15 | 21 |
| 3 | Recent advances in plant disease management | Dec. 13, 2008 to Jan. 02, 2009 | 3 | 17 | 20 |
| 4 | Recent advances in biological control of plant diseases | March 20 to April 09, 2009 | 3 | 17 | 20 |
| 5 | Plant pathology in practice | March 22 to April 11, 2010 | 4 | 18 | 22 |
| 6 | Climate change, precision agriculture and innovative disease control strategies | March 23 to April 12, 2011 | 5 | 15 | 20 |
| 7 | <i>Quality Management and Plant Protection Practices for Enhanced Competitiveness in Agricultural Export</i> | 12 Nov-02 Dec., 2011 | | | 14 |

Infrastructure development (equipment, etc.)

Financial support provided under CAS for the improvement in infrastructural facilities and other ancillary support has benefited not only the scientists but also the students by improving the teaching standard in the department. Following major equipment were added in the department :

- Live Cell Imaging system (Olympus)
- Microbial Identification System (Biolog)
- High Speed Centrifuges (Sorval)
- Olympus Photomicrographic system
- Flow Cytometer
- Water purification system
- Real time PCR,
- Gel Doc systems,

- DNA concentrator
- Rotary Microtome (Leica)
- Media Filtration System (Millipore)
- Incubator shakers

Renovation of lecture room/laboratories

Following infrastructure has been added/ renovated :

- New Biocontrol Laboratory
- Mushroom Laboratory
- Smart class room
- Seminar room
- Cold room

Library upgraded

Several books have been procured that have strengthened the central library. Further, the departmental library was strengthened through the donations of past volumes of Phytopathology and Plant Disease received from Dr. Y.L.Nene, ex-Head, Department of Plant Pathology.

Award/Recognitions

Uttaranchal Ratan Award
2007- Dr. J. Kumar

Poster Paper Award
2007- Dr. K.P. Singh, Second best poster paper award by IPS-M. E. Zone at NDUAT, Kumarganj, Faizabad
2008- Dr. K.P. Singh, Best poster award by Indian Plant Pathological Society-M.E. Zone at G.B. Pant University of Agriculture & Technology, Hill Campus, Ranichauri, Tehri Garhwal.

President of Professional Societies
2008- Dr. R.P. Singh, Mushroom Society of India

Vice-President of Professional Societies:
2007- Dr. R.P. Singh, Indian Society Mycology and Plant Pathology
2009- Dr. J. Kumar, Indian Society of Plant Pathologists

Zonal President/Councilor of Professional Societies:
2008- Dr. K. P. Singh, Indian Phytopathological Society
2010- Dr. K.P. Singh, Indian Society of Mycology and Plant Pathology

Member, Research Advisory Committee designated by the ICAR
2008 – Dr. J. Kumar for Vivekanand Krishi Anusandhan Shala (VPKAS), Almora

2008 – Dr. J. Kumar for Indian Institute of Cotton Research, Nagpur
2009 - Dr. A.P.Sinha for Directorate of Rice Research, Hyderabad
2010 - Dr. J. Kumar for Indian Institute of Temperate Horticulture,
Srinagar

Publications

International Journals

1. Singh, N., Pathak, M.D., Zaidi, N.W., Srivastava, P.C and Singh, U.S. 2007. Assessment and utilization of natural biodiversity for salinity tolerance in scented rice cultivar Kalanamak. *Journal of Crop Improvement*, 20: 205-221.
2. Bahadur, A., Singh, U. P., Sarma, B. K., Singh, D. P., Singh, K.P. and Singh, A. 2007. Foliar application of plant growth-promoting rhizobacteria increases antifungal compound in pea (*Pisum sativum*) against *Erysiphe pisi*. *Mycobiology*, 35: 129 -134.
3. Arif, M., Zaidi, N.W., Haq, Q.M.R. and Singh, U.S. 2008. Etiology and management of Shisham wilt in India using conventional, molecular and *in silico* techniques. *Journal of Biotechnology*, 136: S621-622.
4. Akhtar J., Khalid A. and Kumar B. 2008. Effect of carbon sources, substrates, leachates and water grades on germinability of *Phomopsis vexans*. *African Journal of Agricultural Research*, 3(8): 549-553.
5. Mishra K.K. and R.P. Singh 2008. Evaluation of substrate for production of *Ganoderma lucidum* (W. Curt.: Fr.) P. Karst (Aphyllorphomycetidae). *International Journal of Medicinal Mushrooms*, 10(4): 379-383.
6. Arocha, Y., Singh, A., Pandey, M., Tripathi, A.N., Chandra, B., Shukla, S.K., Singh, Y., Kumar, A., Srivastava, R.K., Zaidi, N.W., Arif, M., Marhal, S., Tewari, A.K., Gupta, M.K., Nath, P.D., Ravindra, R., Khirbat, S.K., Byadgi, A.S., Singh, G. and Boa, E. 2008. New Plant hosts for group 16 Sr II "Candidatus Phytoplasma aurantifolia" in India. *New Disease Reports*, 17: Feb. 2008-July, 2008.
7. Bahadur, A., Singh, U. P., Singh, D. P., Sarma, B. K., Singh, K. P., Singh, A. and Aust, H. J. 2008. Control of *Erysiphe pisi* causing powdery mildew of pea (*Pisum sativum*) by cashewnut (*Anacardium occidentale*) shell extract. *Mycobiology*, 36: 60 – 65.
8. Kumar, A., Singh , U.S., Kumar, J., and Garg, G.K. 2008. Application of molecular and immunodiagnostic tools for detection, surveillance and quarantine regulation of Karnal bunt (*Tilletia indica*) of wheat. *Food and Agriculture Immunology*, 19: 293-311.
9. Mishra, K.K. and Singh, R.P. 2008. Evaluation of substrate fro production of *Ganoderma lucidum* (W. Curt.: Fr.) P. Karst (Aphyllorphomycetidae). *Int. J. Jed. Mushr.* 10(4): 379-383.
10. Singh, U. P., Maurya, S., Singh, K. P., Singh, Amitabh and Singh, Mandavi. 2008. Estimation of phenolic acids in different preparations of seeds of finger millet (*Eleusine coracana*): Their possible implications in human health. *International Journal of Alternative Medicine* 6 (1): 1-10.

11. Arocha, Y, Singh, A., Pandey, M., Tripathi, A.N., Chandra, B., Shukla, S.K., Singh, Y., Kumar, A., Srivastava, R.K., Zaidi, N.W., Arif, M., Narwal, S., Tewari, A.K., Gupta, M.K., Nath, P.D., Rabindran, R., Khirbat, S.K., Byadgi, A.S., Singh, G. and Boa, E. 2009. New plant hosts for group 16SrII, 'Candidatus Phytoplasma aurantifolia', in India. *Plant Pathology*, 58, 391.
12. Arif, M., Zaidi, N.W., Haq, Q.M.R., Khan, S., Husaini, A.M. and Singh, U.S. 2009. Nuclear rDNA sequence data based identification and relative efficiency of ISSR and RAPD markers for genetic diversity of *Fusarium* sp. associated With mango malformation in India. *International Journal of Plant Breeding*, 3(1), 65-70.
13. Arif, M., Zaidi, N.W., Singh, Y.P., Haq, Q.M.R. and Singh, U.S. 2009. A comparative analysis of ISSR and RAPD markers for study of genetic diversity in shisham (*Dalbergia sissoo*), *Plant Molecular Biology Reporter*, 27(4), 488-495.
14. Mishra, K. K., S. J. Kolte, N. I. Nashaat and R. P. Awasyhi 2009. Pathological and biochemical changes in *Brassica juncea* (mustard) infected with *Albugo candida* (white rust). *Plant Pathology*, 58: 80-86.
15. Singh, A., Singh, S., Sarma, B. K., Singh, U.P., Srivastava, R., Singh, K.P. 2009. Phenolic acid analysis and biological activity of methanolic extracts of some medicinal plants against some phytopathogenic fungi. *International Journal of Alternative Medicine*, 6 (2): 1-10.
16. A. K. Gupta, Khosla, K., S. S. Bhardwaj, Thakur, A., Devi1, S., Jarial, R.S., Sharma, C., Singh, K.P., Srivastava, D.K. and Lal, R. 2010. Biological control of crown gall on peach and cherry rootstock colt by native *Agrobacterium radiobacter* Isolates. *The Open Horticulture Journal*, 3: 1-10.
17. Prasad D., Singh, A., Singh, K. P., Bist, S. and Singh, U. P. 2010. The role of phenolic compounds in disease resistance in geranium. *Archives of Phytopathology and Plant Protection*, 43: 615-623
18. Singh, Amitabh, Singh, K.P., Rajwar, G.S. and Singh, U.P. 2010. Phenolic acid content—a criterion for selection of resistant apple cultivars against *Podosphaera leucotricha* (Ell. and Ev.) Salmon. *Archives of Phytopathology and Plant Protection*, 43: 1138-1143.
19. D. Prasad, K. P. Singh and S. Bisht. 2011. Fungicidal management of wilt complex of scented geranium. *Archives of Phytopathology and Plant Protection*, 44: 1519-1533
20. Negi, Y., Garg, S.K., and Kumar, J. 2011. Genetic diversity among cold-tolerant fluorescent *Pseudomonas* isolates from Indian Himalayas and their characterization for biocontrol and plant growth promotion activities. *J. Plant Growth Regulation*, 30(2):128-143.
21. Rawat, L., Singh, Y., Shukla, N. and Kumar, J. 2011. Alleviation of the adverse effects of salinity stress in wheat (*Triticum aestivum* L.) by seed biopriming with salinity tolerant isolates of *Trichoderma harzianum*. *Plant and Soil*, 347 (1): 387-400.
22. Singh, A., Sarma, B.K., Singh, U.P., Singh, R., Singh, H.B. and Singh, K.P.

2011. Metabolite profiling can assist variability analysis in *Trichoderma* species. *Archives of Phytopathology and Plant Protection*, 44: 1697-1702

Indian Journals

1. Ray, A., Kumar, P. and Tripathi, H.S. 2007. Evaluation of bio- agents against *Rhizoctonia solani* Kuhn the cause of aerial blight of soybean. *Indian Phytopathology*, 60 (4): 532-534.
2. Arif, M., Zaidi, N.W. and Singh, U.S. 2007. Identification and molecular characterization of *Fusarium* sp. associated with mango malformation using PCR based techniques. *Journal of Mycology and Plant Pathology*, 37 (1): 186
3. Singh, B., Neelam and Vishnavat, K. 2007. Detection and location of seed-borne inoculum of *Colletotrichum truncatum*, causing anthracnose in soybean. *Journal Mycology and Plant Pathology*, 37(2):327-331.
4. Bandyopadhyay, B.B., Mishra, A.C., Negi, Y.K., Srivastava, R. and Kumar, J. 2007. SDS- PAGE and genetic variation in seed proteins of improved cultivars and local land races of finger millet from Garhwal Himalayas. *Indian Journal of Genetics & Plant Breeding*, 67(2): 209-210.
5. Bhatiya, B.S. and R.P. Awasthi 2007. *In vitro* evaluation of some antifungal plant extracts against *Alternaria brassicae* causing *Alternaria* blight of rapeseed-mustard. *Journal of Plant Disease Sciences* 2(2): 126-131.
6. Bhatt, Pratibha, Kushwaha, K.P.S. and Singh, R.P. 2007. Evaluation of different substrates and casing mixtures for production of *Calocybe indica*. *Indian Phytopathology*, 60 (1): 128-130.
7. Deepshikha and Tewari, A.N. 2007. Efficacy of fungicides as seed dresser for controlling loose smut of wheat caused by *Ustilago segetum* var. *tritici*, *Plant Disease Research*, 1(3) 143-146.
8. Deepshikha and Tewari, A.N. 2007. Impact of pesticides and bio-agents on loose smut of wheat. *Journal of Mycology and Plant Pathology*, 10:1-5.
9. Kavidayal, C.S., Tandon, S., Mishra, K.K. and Singh, R.P. 2007. Reducing power and chelating activity on iron of *Ganoderma lucidum* and *Cordyceps sinensis*. *Journal of Mycology & Plant Pathology*, 37 (1): 170.
10. Khan A.A. and Sinha, A.P. 2007. Screening of *Trichoderma spp.* against *Rhizoctonia solani* the causal agent of rice sheath blight. *Indian Phytopathology*, 450-456.
11. Khan, A. A. and Sinha, A.P. 2007. Biocontrol potential of *Trichoderma* species against sheath blight of rice. *Indian Phytopathology*, 60:208-213.
12. Kumar B. and Dubey K.S. 2007. Effect of media, temperature and pH levels on growth and sporulation of *Colletotrichum dematium* var. *truncata*. *Annals of Plant Protection Sciences*, 15(1): 260-261.

13. Kumar B. and Dubey K.S. 2007. Assessment of losses in different cultivars of soybean due to anthracnose under field conditions. *Journal of Plant Disease Sciences* 2 (1): 110.
14. Kumar B., Kumar J. And Srinivas P. 2007. Occurrence of downy mildew of green ear disease of finger millet in mid hills of Uttarakhand. *Journal of Mycology & Plant Pathology*, 37(3):532-533.
15. Singh, N., Baliyan and Vishunavat, K. 2007. "Detection and location of seed-borne inoculum of *Colletrotrichum truncatum*, causing anthracnose in soybean. *Journal of Mycology and Plant Pathology*, 37(2):327-331.
16. Purwar, J.P., Agrawal, Anjuli and Vishwanath. 2007. Evaluation of post preference of *Spodoptera litura* (Fabricius) among pluses grown in Uttaranchal hills. *Pantnagar Journal of Research*, 5(2): 100-102.
17. Raghuvansi N.S., Dubey K.S. and Kumar, B. 2007. Field evaluation of sugarcane varieties and clones against red rot diseases. *Annals of Plant Protection Sciences*, 15(2): 504-505.
18. Rai J.P., Dubey K.S. and Kumar, B. 2007. Effects of weedicides on growth of *Rhizoctonia solani*. *Annals of Plant Protection Sciences*, 15(2): 529-530.
19. Rai J.P., Dubey K.S. and Kumar B. 2007. *In-vitro* screening of different fungicides and antifungal antibiotics against *Rhizoctonia solani*, causing aerial blight of soybean. *Journal of Plant Disease Sciences* 2(1): 54-56.
20. Ray, A., Kumar, P. and Tripathi, H.S. 2007. Evaluation of bio- agents against *Rhizoctonia solani* Kuhn, the cause of aerial blight of soybean. *Indian Phytopathology*, 60 (4): 532-534.
21. Ray, A. and Kumar, P. 2007. Effect of culture filtrate of *Rhizoctonia solani* Kuhn on germinated seedlings of soybean. *Pantnagar Journal of Research*, 5 (2): 103-104.
22. Sahu, R.K. 2007. Influence of fungicidal seed treatment on seed borne fungi, germination and seedling vigour of lead tree (*Leucaena leucocephala* Lam. De Wit). *Journal of Mycology & Plant Pathology*, 37 (1): 188.
23. Shailbala and Tripathi, H.S. 2007. Current status on research on web blight disease of Urdbean - A Review. *Agriculture Reviews*, 28 (1) : 1-9,
24. Shailbala and Pundhir, V.S. 2007. Effect of date of planting and fungicidal sprays on potato phylloplane fungi. *Annals of Plant Protection Sciences*, 15(2): 434-437.
25. Sharma R. C., Duhan J.C., Sharma O.P. Srivastava J.P., Rai ,R.C. Dharam Singh, Vishunavat K and Gaur, A. 2007. Efficacy of bioagents in combination with Vitavax for the control of loose smut of Wheat. *Seed Research*, 35(2): 265-267.
26. Sharma, R.C., Duhan, J.C., Sharma, O.P., Srivastava, J.P., Rai, R.C., Singh, Dharam, Vishunavat, K and Gaur, A. 2007. Efficacy of fungicides against loose smut of wheat under different agroclimatic zones. *Seed Research*, 35 (1): 135-137.

27. Singh khilendra and Vishunavat, K. 2007. Evaluation of chilli (*Capsicum annum*) cultivars against anthracnose (*Colletotrichum capsici*). *Journal of Mycology and Plant Pathology*, 37(3) : 550-551.
28. Singh R.P., Mishra, K.K., Verma, R.C., Tandon, S and Dubey, A. 2007. Anti-oxidative properties of *Ganoderma lucidum* and *Cordyceps sinensis*. *Mushroom Research*. 16(1): 19-22.
29. Singh, Akhilesh, Singh, D, Kumar R. and Thakur, H.L. 2007. Multiple disease resistance in rabi maize. *Journal of Mycology & Plant Pathology*, 37 (1): 163.
30. Singh, K. P., Prasad, Dinesh, and Yadav, V. K. 2007. The first report of *Rhizoctonia solani* kuhn on seabuckthorn (*Hippophae salicifolia* D. Don) in Uttaranchal Himalayas. *Journal of Mycology & Plant Pathology*, 37: 126 - 127
31. Singh, P.K. and Kushwaha, K.P.S. 2007. Effect of different media and pH on mycelial growth of *Hypsizygus ulmarius*. *Journal of Mycology & Plant Pathology*, 37 (1): 177.
32. Singh, P.K. and Kushwaha, K.P.S. 2007. Effect of substrates on spawn run period and yield of *Hypsizygus ulmarius*. *Journal of Mycology & Plant Pathology*, 37 (1): 170.
33. Singh, Rajvir and Sinha, A.P. 2007. Management of rice sheath blight by *Pseudomonas fluorescens* and grain yield. *Annals of Plant Protection Sciences*, 13: 410-414.
34. Singh, Y. 2007. Identification of sources of resistance against *Colletotrichum graminicola* causing anthracnose of sorghum. *International Journal of Plant Sciences*, 2 (1): 243-244.
35. Vishwanath and Vineeta 2007. Induction of systemic resistance against alternaria leaf blight in mustard by avirulent strain of *Alternaria brassica*. *Pantnagar Journal of Research*, 5(2): 75-81.
36. Vishwanath and Vineeta 2007. Systemic resistance induction against alternaria leaf blight through avirulent strain of *Alternaria brassica* in mustard. *Pantnagar Journal of Research*, 5(1): 66-69.
37. Vishunawat, K and Kumar, J. 2008. Significance of seed pathology in forest trees. *ENVIS Forestry Bulletin* 8: 17-25.
38. Arif, M., Haq, Q.M.R., Zaidi, N.W. and Singh, U.S. 2008. Molecular diversity in *Fusarium solani* associated with sissoo (*Dalbergia sissoo*) wilt assessed by RAPD DNA markers. *Journal of Mycology and Plant Pathology*, 38(2), 258-260.
39. Arif, M., Zaidi, N.W., Haq, Q.M.R. and Singh, U.S. 2008. Genetic variability within *Fusarium solani* as revealed by PCR- fingerprinting based on ISSR markers. *Indian Phytopathology*, 61(3), 305-310.
40. Bhatt, R., Awasthi, R.P. and Tewari, A.K. 2008. Management of downy mildew and white rust diseases of mustard. *Pantnagar Journal of Research*, 7 (1): 54-59.

41. Goswami, K., Tewari, A.K. and Awasthi, R.P. 2008. Comparative study of inoculation methods in *Sclerotinia sclerotiorum* in rapeseed-mustard. *Journal of Mycology & Plant Pathology*, 38 (3): 667-668.
42. Goswami, K., Tewari, A.K. and Awasthi, R.P. 2008. Cultural, morphological and pathogenic variability in isolates of *Sclerotinia sclerotiorum*. *Journal of Mycology & Plant Pathology*, 38 (3): 650—652.
43. Khalid A. and A.P. Sinha 2008. Sensitivity of *Xanthomonas oryzae* pv. *oryzae* isolates to fungicides, antibiotics and botanicals. *Annals of Plant Protection Sciences*, 16: 203-204.
44. Kumar B., Kumar J. and Srinivas, P. 2008. Head Smut: A new disease of barnyard millet in mid hills of Uttarakhand. *Journal of Mycology & Plant Pathology*, 38(1): 142-143.
45. Kumar, B., Kumar, J. and Srinivas, P. 2008. A first record of head smut in barnyard millet from midhills of Uttarakhand. *Journal of Mycology & Plant Pathology*, 38: 142-143.
46. Mishra A., Tewari A.K., and Sharma, J.P. 2008. Effect of bio-control agents and chemicals on root rot and yield attributes in tuberose (*Polianthes tuberosa* Linn.) cultivar Calcutta Double. *Journal of Ornamental Horticulture*, 11(1): 41-44.
47. Negi, Y., Garg, S.K., and Kumar, J. 2008. Plant growth promoting and biocontrol activities of cold-tolerant *Pseudomonas fluorescens* isolates against root rot of pea. *Indian Phytopathology*, 61(4): 461-470.
48. Prasad, D. Singh, K.P. and Kumar, J. 2008. Root rot and wilt complex of rose scented geranium (*Pelargonium graveolens*) in Uttarakhand. *Indian Phytopathology*, 61: 365-366.
49. Shailbala and Pundhir, V.S. 2008. Effect of potato mustard intercropping on late blight disease severity, yield and economics of potato. *Plant Disease Research*, 22(1): 67-69.
50. Shailbala and Pundhir, V.S. 2008. Efficacy of fungicides and bio-agents against late blight severity, infection rate and tuber yield of potato. *Journal of Plant Disease Sciences*, 3(1):
51. Shailbala and Pundhir, V.S. 2008. Fungicide spray schedule for economical management of potato late blight. *Pantnagar Journal of Research*, 6(1): 114-117.
52. Shailbala and Pundhir, V.S. 2008. Integration of host resistance and fungicides for management of late blight of potato. *Potato Journal*, 35(1-2):
53. Singh R.P., Pachauri, V., Verma, R.C., Mishra, K.K., Dubey, A. and Tandon, S. 2008. Extraction and quantification of glucosaminoglycan from *Ganoderma lucidum*. *Journal of Ecofriendly Agriculture*, 3(2):180-182.
54. Singh, R.P.; Pachauri, Vinita; Verma, R.C. ; Mishra, K.K.; Dubey, Ashutosh; and Tandon, Shishir 2008. Extraction and quantification of glucosaminoglycan from *Ganoderma lucidum*. *J. Ecofriendly Agri.* 3(2): 180-182

55. Singh, Y. 2008. Effect of soil solarization and biocontrol agents on plant growth and management of anthracnose of sorghum. *International Journal of Agriculture Sciences*, 4(1): 188-191.
56. Singh, Y. 2008. Screening of sorghum genotypes for resistance against *Gloeocercospora sorghi* causing zonate leaf spot. *International Journal of Agriculture Sciences*, 4(1): 402-403.
57. Singh, Y. and Singh, U.S. 2008. Bio-control agents for control of anthracnose in sorghum. *Journal of Mycology & Plant Pathology*, 38(3): 488-491.
58. Singh, R.P.; Pachauri, V.; Verma, R.C. and Mishra, K.K. 2008. Caterpillar fungus (*Cordyceps sinensis*): A review *J. Ecorfriendly Agril.* 3(1): 1-15.
59. Siraree, A., Negi, Y.K. and Kumar J. 2008. Detection of seed borne inoculum of *Xanthomonas campestris* pv *campestris*, the black rot pathogen of cabbage, and estimation of genetic diversity. *Journal of Mycology & Plant Pathology* 38: 65-72.
60. Rashmi, R. and Vishunavat, K. 2008. Detection of *Alternaria solani* , causing early blight of tomato and its impact on seed health, *Pantnagar Journal of Research*, 6(2)251-253 .
61. Verma R.C., Mishra, K.K. and Singh, R.P. 2008. Evaluation of locally available substrates and grains spawn for production of *Pleurotus sajor-caju*. *International Journal of Agriculture Sciences*, 4(2): 450-452.
62. Bahuguna, R.N., Pandey, M., Nath, M., Kumar, J. and Shukla, A. 2009. Physiological evaluation of *Trichoderma harzianum* against sheath blight in rice. *Indian Journal of Plant Physiology*, 14: 205-208.
63. Bhatt, R., Awasthi, R.P. and Tewari, A.K. 2009. Management of downy mildew and white rust diseases of mustard. *Pantnagar Journal of Research*, 7 (1): 54-59
64. Singh, K., Vishunavat, K and Tewari, R. 2009. Detection, transmission and management of seed-borne inoculum of anthracnose (*Colletotrichum capsici*) in chilli. *Seed Research*, 37(1&2): 143-146.
65. Kumar B. and Kumar J. 2009. Evaluation of small millet genotypes for resistance against important endemic diseases. *Indian Phytopathology* 62(4): 518-521.
66. Kumar B. and Prasad D. 2009. First Record of banded sheath blight disease of barnyard millet caused by *Rhizoctonia solani*. *Journal of Mycology & Plant Pathology*, 39(2): 352-354.
67. Singh, R and Sinha, A.P. 2009. Increased rice seeding growth by root dip treatment with potential strains of *Pseudomonas fluorescens*. *Progressive Research*, 4:138.
68. Singh, K.P., and Kumar, J. 2009. Potential ascospore dose of apple scab fungus, *Venturia inaequalis*, from Indian Himalayas. *Indian Journal of Agricultural Sciences*, 79(3): 184-189.
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Financial Statement

Expenditure under CAFT during XI plan

| Head | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 (Sanction) |
|----------------------------|-------------|-------------|-------------|-------------|-----------------------|
| Operating cost of Training | 3,54,000.00 | 3,53,991.00 | 1,70,976.00 | 3,75,000.00 | 3,75,000.00 |
| Recurring Contingency | 1,99,240.00 | 1,81,103.00 | 1,49,252.00 | 1,67,064.00 | 2,00,000.00 |
| Non-recurring contingency | --- | --- | --- | --- | --- |
| T.A. & DA | 85,912.00 | 99,876.00 | 24,978.00 | 30,000.00 | 30,000.00 |
| Library | 50,000.00 | 50,000.00 | 30,000.00 | 30,000.00 | 30,000.00 |
| Total | 6,89,152.00 | 6,84,970.00 | 3,75,206.00 | 6,02,064.00 | --- |