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| 1. Name of the Scientist | Dr. Mukesh Kumar Khokhar |
| 2. Bio data | |
| a) Designation | Scientist |
| b) E-mail | khokharmk3@gmail.com |
| c) Mobile | 7838205167 |
| d) Joining date in ICAR | 01/01/2016 |
| e) Level of Pay | 63000/- (Pay level-09) |
| f) Discipline | Plant Pathology |
| g) Training & advance exposure in the area of work | 103 rd Foundation Course for Agricultural Research Service |

3. Current area of research

Integrated Pest Management in Rice and Cotton

4. Name of ongoing project

Project 1: Dynamics of insect pests, natural enemies and pathogens with microbials of rice based cropping system (Institute Project)

PI: Dr. M. K. Khokhar, Scientist (Pl. pathology), ICAR-NCIPM

Co-PIs:

NCIPM

1. Dr. R.K. Tanwar, Pr. Scientist (Ag. Ento.), ICAR-NCIPM
2. Dr. Nasim Ahmad, Assistant Chief Technical Officer, ICAR-NCIPM
3. Dr. Rakesh Kumar, Pr. Scientist (Ag. Ento.), ICAR-NCIPM
4. Dr. Satyendra Singh, Pr. Scientist (Nematology), ICAR-NCIPM
5. Dr. Manoj Choudhary, Scientist (Pl. pathology), ICAR-NCIPM

NRCPB

6. Sh. Deepak Singh Bisht, Scientist (Pl. pathology), ICAR-NRCPB

Significant Achievement of Present Year:

- Study conducted in rice –wheat cropping system in the first year indicated higher population of *Trichoerma* in all the rice IPM fields both under Transplanted (TPR) and Direct seeded rice (DSR) whereas the *Fusarium* population was recorded low in IPM as compared to FP. *Fusarium* population showed a declining trend from August onwards and came to its lowest level in wheat crop in April.
- While comparing the *Fusarium* population in rice under TPR and DSR, DSR indicated low population as compared to TPR.

Project 2: Validation and promotion of IPM in rice based cropping system

PI: Dr. R.K. Tanwar, Pr. Scientist (Ag. Entomology), ICAR-NCIPM

Co-PIs:

NCIPM

1. Dr. Satyandra Singh, PR. Scientist (Ag. Entomology), ICAR-NCIPM
2. Mr. V. Kanwar, Scientist (Econ.), ICAR-NCIPM
3. Mr. Rakesh Kumar, Scientist (Ag. Entomology), ICAR-NCIPM
4. DR. M.K. Khokhar, Scientist (Pl. Pathology), ICAR-NCIPM
5. Mr. S.P. Singh, Assistant Chief Technical Officer , ICAR-NCIPM

NRRI

6. Dr. S.D. Mohapatra, Pr. Scientist (Ag. Entomology), ICAR-NRRI, Cuttack
7. Dr. S. Bhagat, Pr. Scientist (Pl. Path.), NRRI- Central Rainfed Upland Rice Research Station (CRURRS) , Hazaribgh

Collaborator: NRRI Cuttack (Odisha)

Location:

- Bambawad (Gautam Budh Nagar, Uttar Pradesh): Transplanted basmati rice
- Tigris (Haridwar, Uttarakhand): Direct seeded basmati rice
- Cuttack (Odisha): Semi deep water rice
- Hazaribagh (Jharkhand) : Direct seeded traditional rice

Duration: 2017-2020

Significant Achievement of Present Year:

- IPM validation in 20 ha in basmati rice at Tigris village (Haridwar, Uttarakhand) resulted in 25.05% reduction in pesticide application, 35.8% increase in paddy grain yield and 40.6% enhancement in B-C ratio over farmers' practices
- IPM technology in basmati rice was extended in 485 ha in Gautam Budh Nagar (Uttar Pradesh) by participation of 450 farmers in a cluster of six villages (around Bambawad village). Implementation of IPM resulted in 92.4% reduction in application of chemical pesticide (a.i.), 19.7% increase in paddy grain yield and 47.3% increase in B/C ratio over farmers' practice. All the IPM farmers received an additional bonus of Rs. 150/- per 100 kg for their IPM rice (Total monetary gain of Rs. 1.61 crore in entire cluster over FP).

Technology Developed from the Project: IPM in basmati rice for Haryana, Uttar Pradesh and Uttarakhand

Project 3: Synthesis and Validation of IPM in direct seeded rice

PI: Rakesh Kumar, Scientist (Ag. Entomology), ICAR-NCIPM

Co-PIs:

NCIPM

1. Dr. RK Tanwar, Pr. Scientist (Ag. Ento.), ICAR-NCIPM
2. Dr. Mukesh Sehgal, Pr. Scientist (Nematology), ICAR-NCIPM
3. Dr. M.K. Khokhar, Scientist (Pl. Path.), ICAR-NCIPM
4. Sh. Vikas Kanwar, Scientist (Economics) , ICAR-NCIPM
5. Sh. SP Singh, Assistant Chief Technical Officer , ICAR-NCIPM

UAS Raichur

6. Dr. Badriprasad, UAS, Raichur

Location:-

- Ruksana (Karnal, Haryana) and
- Gangavathi (Koppal, Raichur, Karnataka)

Duration: 2013-2018

Significant Achievement of Present Year:

- Implementation of IPM in direct-seeded rice (DSR) resulted 12% and 10.5% enhancement in grain yield and B/C ratio, respectively and Rs. 16,725/- higher net return in IPM over farmers' practices at Ruksana.

Technology Developed from the Project

IPM for direct seeded rice in Haryana

Project 4: Large scale implementation of IPM module developed by ICAR-NCIPM for basmati rice cultivation in farmers' participatory mode

(Under Public- Private- Partnership the consultancy provided to Tilda Hain India Pvt. Ltd.)

PI: Dr. R.K. Tanwar, Pr. Scientist (Ag. Entomology), ICAR-NCIPM

Co-PIs:

1. Dr. M.K. Khokhar, Scientist (Pl. Pathology), ICAR-NCIPM
2. Dr. Satyandra Singh, Pr. Scientist (Nematology), ICAR-NCIPM
3. Mr. S.P. Singh, Assistant Chief Technical Officer, ICAR-NCIPM

Location:

- Haryana: Karnal, Panipat & Kaithal
- Madhya Pradesh

Duration: Three year (2017-20)

Significant Achievement of Present Year:

- IPM programme has been implemented in 15785 acre by participation of 1204 farmers in Haryana (Karnal, Panipat and Kaithal districts) and Madhya Pradesh (Mukalwara, Naya Gaon). *Sesbania*, bio-pesticides application and pest monitor (Major components of IPM) have shown more than 50% adoption by farmers.
- Residues of different pesticides in paddy grains have been significantly reduced in IPM as compared to non-IPM. Tricyclazole, highly discouraged in European Union (EU MRL 0.01 mg/kg), has also been significantly reduced (90.99%).

Project 5: Large scale implementation of IPM module for long grain size of rice grain cultivation in farmer participatory mode in Raisen district of Madhya Pradesh India. (Consultancy Project)

(Under Public- Private- Partnership the consultancy provided to Daawat Foods Limited.)

PI: Dr. Mukesh Sehgal, Pr. Scientist (Nematology), ICAR-NCIPM

Co-PIs:

1. Dr. H.R.Sardana, Pr. Scientist (Ag. Entomology), ICAR-NCIPM
2. Dr. R.K. Tanwar, Pr. Scientist (Ag. Entomology), ICAR-NCIPM
3. DR. Sumitra Arora, Pr. Scientist (Ag. Chemicals), ICAR-NCIPM
4. Dr. M.K. Khokhar, Scientist (Pl. Pathology), ICAR-NCIPM
5. Mr. Rakesh Kumar, Scientist (Ag. Entomology), ICAR-NCIPM
6. Mr. Vikas Kanwar, Scientist SG (Economics), ICAR-NCIPM
7. Mr. S.P.Singh, Assistant Chief Technical Officer, ICAR-NCIPM

Location:

Raisen district of Madhya Pradesh

Duration: One year (2017)**Achievements:**

- Successfully implemented IPM activity in 20,000 acres by participation of 1300 farmers in 21 villages in Raisen district of Madhya Pradesh.
- Designed POP to deliver residue compliant paddy procurement at lower aggregate cost than previously incurred.

Publication

1. Vinita Dahima, S.S. Sharma, Divya Chauhan and **M.K. Khokhar** (2018) Physiopathological studies, stage of infection and management of Banded leaf and Sheath Blight of Maize. *Annals of Plant. Protection Sciences*. 26: 170-174
2. Renu Gupta, **M.K. Khokhar** and B.L. Roat (2018) Uptake and bioremediation of heavy metals through Cultivated M ushroom (*Calocybe indica*). *Annals of Plant. Protection Sciences*. 26: 175-180
3. K. S. Hooda, **M. K. Khokhar**, Meena Shekhar, Chikkappa G. Karjagi, Bhupinder Kumar, N. Mallikarjuna, R. K. Devlash, C. Chandrashekara, and O. P. Yadav (2017) Turcicum leaf blight—sustainable management of a re-emerging maize disease. *Journal of Plant Diseases and Protection*, 124:101–113
4. K. S. Hooda, **M. K. Khokhar**, J.C. Shekhar, S.S Sharma, Harleen Kour, Robin Gogoi, and R. Ranga Reddy (2017). Multi-environment field testing to identify broad, stable resistance to post flowering stalk rot of maize. *Indian Phytopathology*, 70:432-439,
5. **M. K. Khokhar**, S.S Sharma, Manoj Choudhary and B.L Roat (2017) Host plant resistance and reaction of maize germplasm entries against post flowering stalk rot in maize. *Journal of Mycology and Plant Pathology*, 47:119-127
6. K.S. Hooda, **M.K. Khokhar**, H. Parmar Robin Gogoi, Deeksha Joshi, S.S. Sharma and O.P. Yadav (2017) Banded Leaf and Sheath Blight of Maize - Historical Perspectives, Current Status and Future Directions. *Proceedings of the National Academy of Sciences, India Section B: Biological Sciences*, 87: 1041-1052. DOI 10.1007/s40011-015-0688-5
7. K.S. Hooda, M.K. Khokhar, Jyoti Kaul, Chikkappa G. Karjagi, Bhupender Kumar, S.S. Sharma, Robin Gogoi, Harleen Kaur, N. Mallikarjuna, R.K. Devlash, A. Basandrai, C. Chandrashekara, Vinod Kumar, S.K. Singh, Pradeep Kumar, I.K. Kalppanavar, and Pravasini Behera (2016) Climate Resilient Options for Management of Maize Diseases in India. *Indian Phytopathology*, 66(4S), 260-265

8. **M K Khokhar**, S. S. Sharma, K S Hooda and B L Roat (2015) Morphological and Molecular Characterization of *Fusarium* spp. causing Post Flowering Stalk Rot of Maize. *Vegetos*, 28: 113-121
9. **M.K. Khokhar**, K.S. Hooda, S.S. Sharma and Vimla Singh (2014) Post flowering stalk rot complex – present status and future prospects. *Maydica*, 59: 226-243
10. **M.K. Khokhar**, S.S. Sharma and Renu Gupta (2014) Integrated Management of Post Flowering Stalk Rot of Maize caused by *Fusarium verticillioides*. *Indian Phytopathology*, 67: 228-233

Book chapter:

K.S. Hooda, Praveen Bagariya and M.K. Khokhar (2017). Maize diseases: current status and their management (diseases of commercial crops in India, edited by H.R. Gautam and S.K. Gupta, Pages 81-100

Award and Fellowship

Best Poster Award for Stable Sources of Multiple Disease Resistance in Maize at 12th Asian Conference and Expert Consultation on Maize for Food, Feed, Nutrition and Environment Security, and APAARI General Assembly Meeting on 30 October – 1 November, 2014 at the Hotel Rama Gardens, Bangkok, Thailand

Technical Bulletins/Extension folder:

- जितेन्द्र सिंह, नसीम अहमद, मुकेश कुमार खोखर, एवं डी.बी. आहुजा (2018) फसलों के नाशीजीवों के प्रतिघातक फफूँदों का घरेलू तौर पर उत्पादन एवं उपयोग । राष्ट्रीय समेकित नाशीजीव प्रबंधन अनुसंधान केंद्र. बुलेटिन पेज 1-20

Technical or popular articles:

- मुकेश कुमार खोखर, अनूप कुमार, आर.के. तंवर, मनोज चौधरी एवं एस.पी. सिंह (2017) रबी की फसलों में कीट व रोग प्रबन्धन, खाद पत्रिका, वर्ष-५८, अंक-१०, ३९-४२
- एम. के. खोखर, आर. के. तंवर, सत्येंद्र सिंह, एस.पी. सिंह, राकेश कुमार एवं मनोज चौधरी (2017) ट्राइकोडर्मा का खेती में महत्त्व व उपयोग । नई दिशाएँ अंक -3,51-53
- राकेश कुमार, आरके तंवर, मुकेश सहगल, एसपी सिंह, मुकेश खोखर एवं विकास कंवर (2017) धान की सीधी बुवाई में समेकित नाशीजीव प्रबंधन (आईपीएम) नई दिशाएँ अंक -3,25-27