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PLANT PATHOLOGY RESEARCH INSTITUTE, FAISALABAD

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Plant Pathology Research Institute (PPRI), Faisalabad is primarily working on all doable management strategies against diseases of economically important crops by finding genetic resistance in available crops germplasms, use of antagonistic microbes, use of proper/effective chemicals along with integrated approaches against these crops maladies.

The main objectives of PPRI are, to carry out diagnostic studies on the causes of plant diseases and their management; virus free basic seed production of newly approved potato varieties and identification of resistant crops germplasm from advance breeding material against diseases. Similarly imparting training in modern techniques of Plant Protection to in-service Agri. Extension personnel, sugar mill's field staff and other stakeholders is a regular feature. Evaluation of new chemicals for management of plant diseases and weeds for standardization purpose is also mandate of the Institute.

Achievements

4,539 micro tubers (ELISA tested) of potato varieties i.e. SH-5, Simply RED, Karoda, Cardinal, Austrix, FD 69-1 and Mozika were produced.

48,415 mini tubers (ELISA tested) of potato varieties i.e. SH-5, Karoda & Cardinal were produced. **11,600** kg of diseases free pre basic potato seed was produced.

11600 kg pre-basic seed potato was produced of approved potato varieties/lines (SH-5, Cardinal and Austerix).

Genetic resistance in crop's germplasms against diseases:

Cotton

TWIG AND STEM BLIGHT

Twenty eight lines/ varieties of local origin were tested and analyzed against twig and stem blight. 15 lines / varieties (FH224, FH118, MNH992, CIM620, CIM631, FH942, CIM343, FH313, FH91, EHSAN, FH466, FH-NOOR, FH342, CIM632, FH458) rated as moderately resistant .



bacterial blight (*Xanthomonas campestris* pv. *malvacearum*)

Fourty three cotton lines/varieties were screened against bacterial blight disease, no line/variety found highly resistant, 5 lines/varieties resistant, 7 moderately resistant, 10 moderately susceptible, 10 susceptible and 11 were highly susceptible.

COTTON LEAF CURL VIRUS (CLCuV)

Out of 12 Cotton varieties/Lines supplied by the breeders, 3 cotton varieties (FH-114, Entry-4, FH-942) were found immune, **3** were found resistant and **2** (FH-Lalazar, Gold) were found susceptible to cotton leaf curl virus.

Wheat

Among 157 bread lines, 142 lines has identified as resistant to yellow rust and 129 bread identified against brown rust.

POTATO

COMMON SCAB (*Streptomyces scabies*)

Thirty eight Potato germplasm were screened out against Potato common scab *Streptomyces scabis* . Out of 38, Twenty five varieties/lines were found resistant against *S. scabis* (Fig. 2).

DIFFERENT POTATO VIRUSES

20 varieties/ lines of potato were screened against major potato viruses including, potato leaf roll virus (PLRV) and potato virus Y (PVY). PV-Y was detected 7% and PLRV was detected 8%.

All **20** varieties were highly infected with PVY and categorized as HS, only **1** variety was subjected to be infected with PVX and **3** varieties were infected with PLRV.

Chickpea

Collar rot (*Phytophthora megasperma*)

Eighty chickpea lines/varieties were evaluated against collar rot disease, nine lines/varieties were found highly resistant, nineteen lines/varieties were resistant, twenty three were moderately resistant, nineteen were susceptible and ten were highly susceptible.

MUNGBEAN / URDBEAN

MUNGBEAN YELLOW MOSAIC VIRUS (MYMV)

Out of 444 candidate lines, **48** entries showed minimum disease and were found Resistant while **327** entries were found moderately resistant and remaining **69** entries were not germinated.

URDBEAN LEAF CRINCKLE VIRUS

Out of 66 candidate lines, **61** entries were found resistant. **3** moderately resistant and **2** were found moderately susceptible.

ONION

IRIS YELLOW SPOT VIRUS

Out of 19 genotypes only **2** i.e; Marvi and Hike were found Highly Resistant (HR), **4** (Super Sarhad, Red Flame, Premium F1 and F1 Amazone) moderately resistant (R), **3** (Pink Panther, F1 zeus and Hybrid Yellow Granex) Moderately Resistant (MR), **5** (Diana, Riana, White Pearl, Anoki F1 and Kareem F1) Moderately Susceptible (MS), **3** (Red ORB F1, Golden ORB F1 and Texas early Grano) Susceptible (S) and **2** (Phulkara and Mustang F1) were Highly Susceptible (HS).

CUCUMBER

CUCUMBER MOSIAC VIRUS

Total sixteen varieties were screened against cucumber mosaic virus (CMV). 1 variety (Rayyan F1) was found Resistant (R), 1 (Yeilder) Moderately Resistant (MR), 6 (JCB 702, 14C45276, Zhong-Nong, Kingstar, Multistar and TCB-705) moderately susceptible (MS), 6 (Java, TCB-701, SXO-3776 F1, TCB-703, Space master and Chelsea) Susceptible (S) and 2 (Poyraz F1 & 15C45Z77) were found Highly Susceptible (HS).

TOMATO

TOMATO YELLOW LEAF CURL VIRUS

Out of 15 varieties only 1 (17265) was resistant, 3 (17263, 10139 and 17262) moderately resistant (MR), 4 moderately susceptible (MS), 1 susceptible (S) and 6 were highly susceptible (HS).

CITRUS

CITRUS TRISTIZA CLOSTERO VIRUS (CTV)

1200 samples were collected from Sargodha, 100 samples from Faisalabad, 595 from T.T.Sing from which 36, 20 and 40 were found infected respectively. Overall infection percentage recorded was 5%.

CHEMICAL CONTROL

TWIG AND STEM BLIGHT OF COTTON

Four different fungicides were sprayed on cotton variety FH-142, to check their effectiveness for control of twig and stem blight disease. The

treatment application of score 250 EC @ 1cc/L of water gave effective disease control and higher yields.

BACTERIAL BLIGHT OF POMEGRANATE (*Xanthomonas axonopodis pv. punicae*)

Four different fungicides were sprayed on pomegranate variety Sanduri, to check their effectiveness for control of bacterial blight disease. The treatment application of Flare (Streptomycin Sulphate) @ 1g/L of water gave effective disease control and higher yields.



STEM AND CROWN ROT OF BERSEEM (*Sclerotinia trifiliorum*)

Four different fungicides were sprayed on barseem variety super barseem, to check their effectiveness for control of stem and crown rot disease. The treatment application of Ernesto Silver 240% FS @ 0.5cc/L of water gave effective disease control and higher yields.

GRAY MOLD OF TOMATO (*Botrytis cinerea*)

Six different fungicides were used to study their efficacy against grey mold disease of tomato. Variety Nagina was used and disease was

artificially produce. Revus followed by Amistar Top exhibited the most effectiveness against the disease.

Collar rot of papaya (*Phytophthora megasperma*)

Five different fungicides were applied on papaya to check their efficacy against collar rot disease. The treatment application of "Ridomil-Gold" was found most effective against the disease

Collar rot of Pea (*Phytophthora megasperma*)

Five different fungicides were applied on pea to check their efficacy against collar rot disease. The treatment application of "Ridomil-Gold" was found most effective against the disease.

Integrated of management

CLCV in cotton

The lowest CLCV%age was observed in treatment in which seed treatment, spray, early rouging and weed control was applied throughout the season while maximum CLCV%age was examined

Plant Protection Trainings:

Plant protections training courses were arranged for In-Service Agri. Extension staff, Sugar Mills field staff, Master Trainers and other stakeholders engaged in agri. sector in 15 sessions. 48 Agriculture Officers, 64 Field Asstts, 83 Master Trainers, 43 of Sugar Mills, 125 other stakeholders were trained. Total 363 personnel were trained in the field of plant protection.

EPIDEMIOLOGY

SOWING DATES ON OF STEM ROT OF SESAME

Sesame variety T-5 was used to record the incidence of the disease in relation to different sowing times i.e. Mid-June, End of June, Mid

July and End of July. Mid July was found the most suitable time of avoid the disease.

INDUCED SYSTEMIC RESISTANCE

OKRA AGAINST LEAF CURL VIRUS USING PLANT GROWTH PROMOTING RHIZOBACTERIA (PGPR)

As compared to control 2nd spray of Azospirillum, Pseudomonas and Azotobactor showed significant results. OK-1315 is highly susceptible; Ikra is Moderately susceptible while Pusa Swami is Moderately resistant.

SURVEY

POTATO FOR POTATO CYST NEMATODE (*Globodera spp*) IN PUNJAB

225 soil samples from potato field of five districts (Sahiwal, Okara, Kasur, Pakpattan and Chiniot) were collected and analyzed in Lab for Potato Cyst Nematode (PCN) detection. However none of sample was found positive for PCN.

Publications:

1. M. Mohsan, S. Ali, M. Umar Shahbaz, **Saba Saeed**, M. Burhan (2017). In vitro efficacy of different growth media and crude plant extracts against Mycelia growth of *Phytophthora capacii*. /Journal of applied biology and biotechnology. Vol. 5(4)43-47 **2017**.
2. Muhammad Mohsan, **Saba Saeed** and Samida Qamar (2017). Varietal reaction of different okra cultivars against okra yellow vein mosaic virus under field condition/18-21/05-03-2017 **Advance**

- research journal of multidisciplinary discoveries.
3. **Saba Saeed**, Muhammad Mohsan and Aiman Sattar (2017). Screening of potato (cultivars) Germplasm against potato leaf roll virus under natural field conditions/14-17/05-03-2017 Advance research journal of multidisciplinary discoveries.
 4. Muhammad Rizwan Bashir, Muhammad Atiq, **Muhammad Mohsin**, Muhammad Raheel, Waseem Abbas (2017). Management of fusarium wilt of chilli caused by *fusarium oxysporum F.Sp. capsici* through nutritional amendments under green house conditions/185-191/17-03-2017. International Journal Of Bio Sciences
 5. **A. Mustafa**, M. Burhan, m. iqbal, S. Ali, M. R. Bahir, S. Saeed & m. Zeeshan Niaz (2017). "Assessing the Host Status of Pea Germplasm against Collar Rot Disease Caused by *Phytophthora Megasperma* under Natural Conditions of Faisalabad". Academy of Agriculture Journal 2: 7 (2017)
 6. **A. Mustafa** & M. Mohsin (2017). "Mycoflora associated with grain discoloration of common rice cultivars and their management/1-5/23-04-2017". International Journal of Advanced Research and Biological Sciences.
 7. Shamim Akhtar, **A. Mustafa**, M. Mohsan & U. shafqat (2017). "Comparative Efficacy of Two aphid species *Myzus persicae* and *Aphis gossypii* in transmission of PLRV & PVY" Submitted in Int. Jour. Agri. Research.
 8. Shamim Akhtar, **A. Mustafa**, M. Mohsan & U. shafqat (2017). "Field performance of different potato varieties/lines and serological confirmation against Potato Virus-Y" (2017) Submitted in Int. Jour. Agri. Research.
 9. S. Shamim, **A. Musataf**, M. Mohsin & U. shafqat (2017). "Screening of Potato Germplasm against PVY under Natural Field Conditions in Pakistan" (2017) International journal Agri. Res., (Submitted).
 10. M. Iqbal, **Azher Mustafa**, Bushra Ishfaq, M. Mohsin, Ahtesham Ali & Saba Saeed. "Screening of Citrus Cultivars against Citrus Tristeza Virus (CTV)" International journal of Agriculture & Biology (2017). (Submitted)

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