

# ANNUAL PROGRAMME OF RESEARCH WORK OF POTATO RESEARCH INSTITUTE, SAHIWAL FOR SUMMER 2017

**1. TITLE** **CREATION OF GENETIC VARIABILITY IN  
POTATO FOR HIGH YIELD AND EARLINESS  
THROUGH HYBRIDIZATION**

**OBJECTIVE:** To select new genotypes with high yield potential and earliness

**RESEARCH WORKERS:** Dr. Syed Ijaz-ul-Hassan  
Mr. Maqbool Hussain Anjum  
Mr. Sajid Habib  
Dr. Nawaz Sajid  
Rana Aftab Iqbal  
Mr. Saqib Saleem  
Mr. Muhammad Mudassir Hussain  
Miss Iqra Ibrar

**LOCATION:** Murree

**DURATION:** Continuous

**TREATMENTS:** Parents:

**Potato Research Institute, Sahiwal**

High yielding= PRI-Red, Ruby, Sadaf, FD 76-18, FD 73-44, FD 73-49, FD 76-59, FD 78-51 & FD 81-1  
Early bulking = SH-5, Kuroda, Sante & FD 35-36,

**Potato Research Station, Sahowali (Sialkot)**

**Early and High Yielding Germplasm**

Early & High yielding= SH-5, Kuroda, SH-1035, SH-795, PRI-Red, Diamant, SH-1643 & SH-1644

**METHODOLOGY:** Two sets of parents will be planted during May at 10 days interval to synchronize flowering. Twenty seven cross combinations along with their reciprocals will be made during July and August to get at least 15 – 20 berries of each cross and their reciprocals.

**Combinations along with reciprocals****PRI, Sahiwal**

| <b>Cross combinations</b> | <b>Reciprocals</b>  |
|---------------------------|---------------------|
| 1. FD 73-44 x Kuroda      | Kuroda x FD 73-44   |
| 2. FD 73-49 x Kuroda      | Kuroda x FD 73-49   |
| 3. PRI-Red x Kuroda       | Kuroda x PRI-Red    |
| 4. FD 78-51 x SH-5        | SH-5 x FD 78-51     |
| 5. Sadaf x Sante          | Sante x Sadaf       |
| 6. Ruby x Sante           | Sante x Ruby        |
| 7. FD 81-1 x FD 36-36     | FD 35-36 x FD 81-1  |
| 8. FD 76-59 x FD 35-36    | FD 35-36 x FD 76-59 |
| 9. FD 76-18 x Kuroda      | Kuroda x FD 76-18   |
| 10. FD 73-44 x SH-5       | SH-5 x FD 73-44     |
| 11. FD 73-49 x SH-5       | SH-5 x FD 73-49     |

**PRS, Sahowali (Sialkot)**

| <b>Cross combinations</b> | <b>Reciprocals</b> |
|---------------------------|--------------------|
| 1. SH-5 x SH-1643         | SH-1643 x SH-5     |
| 2. KURODA x SH-1035       | SH-1035 x KURODA   |
| 3. PRI-RED x SH-5         | SH-5 x PRI-RED     |
| 4. PRI RED x SH-795       | SH-795 x PRI RED   |
| 5. SH-1644 x PRI-RED      | PRI-RED x SH-1644  |
| 6. DIAMANT x PRI-RED      | PRI-RED x DIAMANT  |
| 7. SH-5 x DIAMANT         | DIAMANT x SH-5     |
| 8. SH-5 x KURODA          | KURODA x SH-5      |
| 9. SH-1643 x SH-1035      | SH-1035 x SH-1643  |
| 10. PRI-RED x SH-1035     | SH-1035 x PRI-RED  |
| 11. SH- 795 x SH-1643     | SH-1643 x SH- 795  |
| 12. SH-1644 x DIAMANT     | DIAMANT x SH-1644  |
| 13. SH-1643 x KURODA      | KURODA x SH-1643   |
| 14. SH-5 x SH-1644        | SH-1644x SH-5      |
| 15. KURODA x SH-5         | SH-5 x KURODA      |
| 16. DIAMANT x KURODA      | KURODA x DIAMANT   |

PLOT SIZE

4 x 3m (For each)

SPACING

75 x 30cm

PREVIOUS YEARS RESULTS

With experiment No. 7

**2. TITLE** **CREATION OF GENETIC VARIABILITY IN POTATO FOR HIGH YIELD THROUGH HYBRIDIZATION**

**OBJECTIVE:** To select new genotypes with more high yield potential

**RESEARCH WORKERS:** Dr. Syed Ijaz-ul-Hassan  
Rana Aftab Iqbal  
Mr. Saqib Saleem  
Mr. Muhammad Mudassir Hussain  
Miss Iqra Ibrar

**LOCATION:** Murree

**DURATION:** Continuous

**TREATMENTS:** Parents:

**Potato Research Institute, Sahiwal**

High yielding= PRI-Red, Ruby, Sadaf, FD 73-44, FD 73-49, FD 78-51

**METHODOLOGY:**

Two sets of parents will be planted during May at 10 days interval to synchronize flowering. Nine cross combinations along with their reciprocals will be made during July and August to get at least 15 – 20 berries of each cross and their reciprocals.

**Combinations along with reciprocals**

**PRI, Sahiwal**

| <b>Cross combinations</b> | <b>Reciprocals</b>  |
|---------------------------|---------------------|
| 1. FD 73-49 x FD 73-44    | FD 73-44 x FD 73-49 |
| 2. PRI-Red x FD 78-51     | FD 78-51 x PRI-Red  |
| 3. FD 73-44 x PRI-Red     | PRI-Red x FD 73-44  |
| 4. FD 73-49 x PRI-Red     | PRI-Red x FD 73-49  |
| 5. Ruby x PRI-Red         | PRI-Red x Ruby      |
| 6. Sadaf x PRI-Red        | PRI-Red x Sadaf     |
| 7. Ruby x Sadaf           | Sadaf x Ruby        |
| 8. Ruby x FD 78-51        | FD 78-51 x Ruby     |
| 9. Sadaf x FD 78-51       | FD 78-51 x Sadaf    |

|                        |                   |
|------------------------|-------------------|
| PLOT SIZE              | 4 x 3m (For each) |
| SPACING                | 75 x 30cm         |
| PREVIOUS YEARS RESULTS | New project       |

**3. TITLE** **CREATION OF GENETIC VARIABILITY IN POTATO FOR HIGH YIELD AND LATE BLIGHT TOLERANCE**

**OBJECTIVE:** To select new genotypes with high yield and late blight tolerance.

**RESEARCH WORKERS:** Dr. Syed Ijaz-ul-Hassan  
Mr. Maqbool Hussain Anjum  
Dr. Nawaz Sajid  
Mr. Sajid Habib  
Rana Aftab Iqbal  
Mr. Saqib Saleem  
Mr. Muhammad Mudassir Hussain  
Miss Iqra Ibrar

**LOCATION:** Murree

**DURATION:** Continuous

**TREATMENTS:** Parents:

**Potato Research Institute, Sahiwal**

High yielding= PRI-Red, Sadaf, FD 73-44, FD 73-49, FD 78-51, FD 81-1, Sante

Late blight tolerant = FD 76-59, Ruby, FD 77-4, FD 78-15

**Potato Research Station, Sahowali (Sialkot)**

**Late blight tolerant:**

SH-718, SH-1195, PRI-Red, SH-1259, SH-1662

**METHODOLOGY:**

Two sets of parents will be planted during May at 10 days interval to synchronize flowering. Seventeen cross combinations along with their reciprocals will be made

during July and August to get at least 15 – 20 berries of each cross and their reciprocals.

### Combinations along with reciprocals

#### PRI, Sahiwal

| Cross combinations     | Reciprocals         |
|------------------------|---------------------|
| 1. Ruby x FD 73-44     | FD 73-44 x Ruby     |
| 2. Ruby x FD 73-49     | FD 73-49 x Ruby     |
| 3. FD 78-51 x FD 76-59 | FD 76-59 x FD 78-51 |
| 4. PRI-Red x FD 78-15  | FD 78-15 x PRI-Red  |
| 5. Sadaf x FD 77-4     | FD 77-4 x Sadaf     |
| 6. FD 81-1 x FD 77-4   | FD 77-4 x FD 81-1   |
| 7. Sadaf x FD 78-15    | FD 78-15 x Sadaf    |
| 8. Sante x FD 76-59    | FD 76-59 x Sante    |

#### PRS, Sahowali (Sialkot)

| Cross combinations   | Reciprocals       |
|----------------------|-------------------|
| 1. SH-718 x SH-1662  | SH-1662 x SH-718  |
| 2. SH-1195 x PRI-RED | PRI-RED x SH-1195 |
| 3. PRI-RED x SH-718  | SH-718 x PRI-RED  |
| 4. SH-1259 x SH-1662 | SH-1662 x SH-1259 |
| 5. SH-1195x SH-718   | SH-718 x SH-1195  |
| 6. PRI-RED x SH-1259 | SH-1259 x PRI-RED |
| 7. SH-718 x SH-1259  | SH-1259 x SH-718  |
| 8. SH-1195 x SH-1259 | SH-1259 x SH-1195 |
| 9. PRI-RED x SH-1662 | SH-1662 x PRI-RED |

PLOT SIZE 4 x 3m

SPACING 75 x 30cm

PREVIOUS YEARS RESULTS With experiment No. 7

#### 4. TITLE

#### CREATION OF GENETIC VARIABILITY IN POTATO FOR FROST TOLERANCE

OBJECTIVE: To select new genotypes with frost tolerance.

RESEARCH WORKERS: Dr. Syed Ijaz-ul-Hassan  
Mr. Maqbool Hussain Anjum  
Mr. Sajid Habib  
Dr. Nawaz Sajid

Rana Aftab Iqbal  
 Mr. Saqib Saleem  
 Mr. Muhammad Mudassir Hussain  
 Miss Iqra Ibrar

LOCATION: Murree  
 DURATION: Continuous  
 TREATMENTS: Parents:

**Potato Research Institute, Sahiwal**

High yielding= Sadaf, FD 76-18, FD 73-44, FD 81-1, Sante

Frost tolerant = FD 78-51, FD 76-59, FD 73-49, PRI-Red,  
 Ruby

**Potato Research Station, Sahowali (Sialkot)**

**Frost tolerant:**

SH-1294, SH-1655, PRI-Red, SH-1644, SH-1035, Diamant

**METHODOLOGY:**

Two sets of parents will be planted during May at 10 days interval to synchronize flowering. Nineteen cross combinations along with their reciprocals will be made during July and August to get at least 15 – 20 berries of each cross and their reciprocals.

**Combinations along with reciprocals**

**PRI, Sahiwal**

| <b>Cross combinations</b> | <b>Reciprocals</b>  |
|---------------------------|---------------------|
| 1. FD 78-51 x FD 73-44    | FD 73-44 x FD 78-51 |
| 2. FD 78-51 x FD 73-49    | FD 73-49 x FD 78-51 |
| 3. PRI-Red x FD 81-1      | FD 81-1 x PRI-Red   |
| 4. FD 76-59 x Sadaf       | Sadaf x FD 76-59    |
| 5. Sadaf x FD 73-49       | FD 73-49 x Sadaf    |
| 6. Ruby x FD 76-18        | FD 76-18 x Ruby     |
| 7. Sante x FD 73-49       | FD 73-49 x Sante    |
| 8. Sante x FD 78-51       | FD 78-51 x Sante    |

**PRS, Sahowali (Sialkot)**

| <b>Cross combinations</b> | <b>Reciprocals</b> |
|---------------------------|--------------------|
| 1. PRI-RED x SH-1655      | SH-1655 x PRI-RED  |
| 2. SH-1294 x SH-1644      | SH-1644 x SH-1294  |
| 3. Diamant x PRI-RED      | PRI-RED x Diamant  |
| 4. SH-1655 x SH-1035      | SH-1035 x SH-1655  |

|                       |                   |
|-----------------------|-------------------|
| 5. PRI-RED x SH-1294  | SH-1294 x PRI-RED |
| 6. SH-1655 x SH-1294  | SH-1294 x SH-1655 |
| 7. Diamant x SH-1655  | SH-1655 x Diamant |
| 8. SH-1035 x SH-1294  | SH-1294 x SH-1035 |
| 9. SH-1294 x Diamant  | Diamant x SH-1294 |
| 10. SH-1644 x SH-1035 | SH-1035 x SH-1644 |
| 11. SH-1655 x SH-1644 | SH-1644 x SH-1655 |

PLOT SIZE 4 x 3m

SPACING 75 x 30cm

PREVIOUS YEARS RESULTS With experiment No. 7

**5. TITLE CREATION OF GENETIC VARIABILITY IN POTATO FOR TOLERANCE AGAINST VIRUSES**

OBJECTIVE: To select new gene combinations with virus tolerance.

RESEARCH WORKERS: Dr. Syed Ijaz-ul-Hassan  
Mr. Maqbool Hussain Anjum  
Mr. Sajid Habib  
Dr. Nawaz Sajid  
Mr. Saqib Saleem

LOCATION: Murree

DURATION: Continuous

TREATMENTS: Parents:

**Potato Research Station, Sahowali (Sialkot)**

**Virus tolerant:**

SH-718, SH-729, SH-1636, SH-1259, SH-1662, SH-1195

**METHODOLOGY:**

Two sets of parents will be planted during May at 10 days interval to synchronize flowering. Eight cross combinations along with their reciprocals will be made during July and August to get at least 15 – 20 berries of each cross and their reciprocals.

**Combinations along with reciprocals**

**PRS, Sahowali (Sialkot)**

| <b>Cross combinations</b> | <b>Reciprocals</b> |
|---------------------------|--------------------|
| 1. SH-1638 x SH-1259      | SH-1259 x SH1638   |
| 2. SH1662 x SH-1195       | SH-1195 x SH-1662  |
| 3. SH-729 x SH-718        | SH-718 x SH-729    |
| 4. SH-718 x SH-1638       | SH-1638 x SH-718   |
| 5. SH-1259 x SH-729       | SH-729 x SH-1259   |
| 6. SH-1638 x SH-1662      | SH-1662 x SH1638   |
| 7. SH-729 x SH-1638       | SH-1638 x SH-729   |
| 8. SH-1662 x SH-729       | SH-729 x SH-1662   |

PLOT SIZE 4 x 3m

SPACING 75 x 30cm

PREVIOUS YEARS RESULTS With experiment No. 7

**6. TITLE** **CREATION OF GENETIC VARIABILITY IN POTATO FOR TOLERANCE AGAINST COMMON SCAB**

OBJECTIVE: To select new gene combinations with common scab tolerance.

RESEARCH WORKERS: Dr. Syed Ijaz-ul-Hassan  
Dr. Sajid Nawaz  
Rana Aftab Iqbal  
Mr. Saqib Saleem  
Mr. Muhammad Mudassir Hussain  
Miss Iqra Ibrar

LOCATION: Murree

DURATION: Continuous

TREATMENTS: Parents:

**Potato Research Institute, Sahiwal**

High yielding= PRI-Red, Ruby, Sadaf, FD 73-44, FD 73-49, Sante

Common scab tolerant = Faisalabad White, FD 76-59, FD 77-4, FD 78-51

METHODOLOGY:



Two sets of parents will be planted during May at 10 days interval to synchronize flowering. Eight cross combinations along with their reciprocals will be made during July and August to get at least 15 – 20 berries of each cross and their reciprocals.

**Combinations along with reciprocals**

**PRI, Sahiwal**

| <b>Cross combinations</b> | <b>Reciprocals</b>   |
|---------------------------|----------------------|
| 1. Fsd White x Ruby       | Ruby x Fsd White     |
| 2. Fsd White x FD 73-49   | FD 73-49 x Fsd White |
| 3. Ruby x FD 76-59        | FD 76-59 x Ruby      |
| 4. FD 73-44 x FD 76-59    | FD 76-59 x FD 73-44  |
| 5. PRI-Red x FD 77-4      | FD 77-4 x PRI-Red    |
| 6. Sante x FD 77-4        | FD 77-4 x Sante      |
| 7. Sante x FD 78-51       | FD 78-51 x Sante     |
| 8. Sadaf x FD 78-51       | FD 78-51 x Sadaf     |

PLOT SIZE 4 x 3m

SPACING 75 x 30cm

PREVIOUS YEARS RESULTS New Project

**7. TITLE CREATION OF GENETIC VARIABILITY IN POTATO FOR HIGH DRY MATTER**

OBJECTIVE: To select new genotypes with high yield & dry matter.

RESEARCH WORKERS: Dr. Syed Ijaz-ul-Hassan  
Mr. Maqbool Hussain Anjum  
Mr. Sajid Habib  
Dr. Nawaz Sajid  
Rana Aftab Iqbal  
Mr. Saqib Saleem  
Mr. Muhammad Mudassir Hussain  
Miss Iqra Ibrar  
Mr. Azhar Mehmood

LOCATION: Murree

DURATION: Continuous

TREATMENTS/ Parents:  
**Potato Research Institute, Sahiwal**

High yielding= PRI-Red, Ruby, Sadaf, FD 73-44, FD 73-49,

High dry matter= FD 74-30, FD 74-50, FD 35-36 & N-96-25

### Potato Research Station, Sahowali (Sialkot)

#### Parents with high dry matter contents

SH-795, Diamant, SH-1644, SH-1655 SH-5, SH-1035.

#### METHODOLOGY:

Two sets of parents will be planted during May at 10 days interval to synchronize flowering. Eighteen cross combinations along with their reciprocals will be made during July and August to get at least 5 – 10 berries of each cross and their reciprocals.

#### Combination

#### PRI, Sahiwal

| Cross combinations      | Reciprocals         |
|-------------------------|---------------------|
| 1. Sadaf x FD 74-30     | FD 74-30 x Sadaf    |
| 2. Ruby x FD 74-30      | FD 74-30 x Ruby     |
| 3. Sadaf x FD 74-50     | FD 74-50 x Sadaf    |
| 4. Ruby x FD 74-50      | FD 74-50 x Ruby     |
| 5. FD 73-44 x FD 74-30  | FD 74-30 x FD 73-44 |
| 6. FD 73-49 x FD 74-50  | FD 74-50 x FD 73-49 |
| 7. PRI-Red x FD 74-30   | FD 74-30 x PRI-Red  |
| 8. FD 35-36 x Sadaf     | Sadaf x FD 35-36    |
| 9. FD 35-36 x Ruby      | Ruby x FD 35-36     |
| 10. N-9625 x Ruby       | Ruby x N-9625       |
| 11. FD 74-30 x FD 74-50 | FD 74-50 x FD 74-30 |
| 12. FD 35-36 x N-9625   | N-9625 x FD 35-36   |

#### PRS, Sahowali (Sialkot)

| Cross combinations | Reciprocals       |
|--------------------|-------------------|
| SH-5 x SH-795      | SH-795 x SH-5     |
| SH-1655 x SH-795   | SH-795 x SH-1655  |
| SH-1035 x SH-795   | SH-795 x SH-1035  |
| SH-795x SH-1655    | SH-1655 x SH-795  |
| SH-1644 x SH-795   | SH-795 x SH-1644  |
| Diamant x SH-1035  | SH-1035 x Diamant |

PLOT SIZE

4 x 3m

SPACING

75 x 30cm

PREVIOUS YEARS  
RESULTS (1,3,4,5 & 7)

A total number of 35 crosses were attempted. Out of 35 crosses, 17 crosses were successful from which 53 berries were obtained.

| Sr. No.      | Cross combinations  | Berries   |
|--------------|---------------------|-----------|
| 1            | PRI-RED x SH-5      | 03        |
| 2            | FD 76-18 x FD 35-36 | 03        |
| 3            | SH-795 x Ludmilla   | 05        |
| 4            | Ludmilla x SH-5     | 02        |
| 5            | SH-1195 x Toureg    | 01        |
| 6            | SH-5 x Diamant      | 04        |
| 7            | Diamant x SH-795    | 06        |
| 8            | SS-1 x Diamant      | 02        |
| 9            | PRI-RED x FD 73-49  | 03        |
| 10           | SH-718 x SH-1196    | 01        |
| 11           | SH-5 x SH-1196      | 02        |
| 12           | FD 74-30 x FD 63-1  | 03        |
| 13           | FD 74-30 x FD 74-50 | 02        |
| 14           | SH-1196 x SH-1195   | 05        |
| 15           | SH-5 x SH-1181      | 02        |
| 16           | SH-1181 x SS-2      | 06        |
| 17           | SH-1196 x Ludmilla  | 03        |
| <b>Total</b> |                     | <b>53</b> |

**8. TITLE**

**RAISING AND SCREENING OF NURSERY**

OBJECTIVE:

To select progenies with high yield potential and resistance to pest and diseases.

RESEARCH WORKER:

Dr. Syed Ijaz-ul-Hassan  
Maqbool Hussain Anjum  
Mr. Saqib Saleem and  
Mr. Sajid Habib

LOCATION:

Murree

DURATION:

Continuous

TREATMENTS/  
METHODOLOGY

Cross combinations: 19  
Nursery will be raised during the month of May at Murree from crosses of summer 2015

Plant to plant distance: 15cm  
 Row to row distance: 30cm

Data on morphological characters and resistance to pest and diseases will be recorded.

PREVIOUS RESULTS: 81 single plant from 19 crosses of the year 2015 were selected.

| Sr. No. | Cross Combinations  | No. of Plant selected | No. of mini tubers | Total No. of plants |
|---------|---------------------|-----------------------|--------------------|---------------------|
| 1       | SH-718 X SH-1155    | P1                    | 7                  | 5                   |
|         |                     | P2                    | 5                  |                     |
|         |                     | P5                    | 8                  |                     |
|         |                     | P6                    | 4                  |                     |
|         |                     | P8                    | 4                  |                     |
| 2       | FD 78-51 x SH-5     | P2                    | 3                  | 5                   |
|         |                     | P3                    | 6                  |                     |
|         |                     | P4                    | 3                  |                     |
|         |                     | P6                    | 5                  |                     |
|         |                     | P8                    | 3                  |                     |
| 3       | SH-5 X SH-1210      | P1                    | 2                  | 6                   |
|         |                     | P2                    | 3                  |                     |
|         |                     | P3                    | 5                  |                     |
|         |                     | P4                    | 5                  |                     |
|         |                     | P5                    | 2                  |                     |
|         |                     | P8                    | 2                  |                     |
| 4       | Diamant x Red River | P5                    | 10                 | 2                   |
|         |                     | P6                    | 13                 |                     |
| 5       | SH-692 X SH-1195    | P1                    | 4                  | 4                   |
|         |                     | P3                    | 2                  |                     |
|         |                     | P4                    | 4                  |                     |
|         |                     | P6                    | 1                  |                     |
| 6       | FD 78-36 x PRI-RED  | P1                    | 6                  | 3                   |
|         |                     | P2                    | 2                  |                     |
|         |                     | P3                    | 3                  |                     |
| 7       | SH-1181 x SH-5      | P5                    | 6                  | 5                   |
|         |                     | P6                    | 4                  |                     |
|         |                     | P7                    | 2                  |                     |
|         |                     | P9                    | 3                  |                     |
|         |                     | P10                   | 3                  |                     |
| 8       | SH-1181 x SH-1210   | P1                    | 2                  | 5                   |
|         |                     | P4                    | 1                  |                     |
|         |                     | P5                    | 2                  |                     |
|         |                     | P6                    | 3                  |                     |
|         |                     | P7                    | 1                  |                     |
| 9       | Burna x FD 171      | P1                    | 13                 | 3                   |
|         |                     | P4                    | 10                 |                     |
|         |                     | P5                    | 8                  |                     |
| 10      | FD 63-1 x FD 73-110 | P1                    | 2                  | 3                   |
|         |                     | P2                    | 4                  |                     |
|         |                     | P3                    | 3                  |                     |
| 11      | SH-718 x SH-661     | P7                    | 5                  | 2                   |
|         |                     | P8                    | 2                  |                     |
| 12      | SH-729 x SH-718     | P3                    | 2                  | 6                   |
|         |                     | P4                    | 5                  |                     |
|         |                     | P5                    | 4                  |                     |
|         |                     | P8                    | 3                  |                     |
|         |                     | P9                    | 2                  |                     |
|         |                     | P10                   | 4                  |                     |



The experiment will be conducted in Kaghan valley being the conducive environment for late blight during summer season (May to October). Data will be recorded for disease incidence %age on the basis of visual observation and yield in September/October

Disease incidence % age = (No. of infected plants /total No. of observed plants) X 100

PREVOIUS YEAR RESULTS

New experiment

(Dr. Syed Ijaz-ul-Hassan)  
Director  
Potato Research Institute,  
Sahiwal