

A. SUMMER MUSTARD, FAISALABAD

1. TITLE HYBRIDIZATION PROGRAMME (*B. juncea*)

OBJECTIVE To make fresh crosses for the development of high yielding canola cultivar.

RESEARCH WORKERS Huma Qamar
Mariam Hassan
Hafiz Saad Bin Mustafa
Tariq Mahmood

PROJECT DURATION Continuous nature

LOCATION Faisalabad

TREATMENTS/
METHODOLOGY Following crosses will be made keeping ZBJ-08051 and AARI Canola as male parent having low Erucic acid and low Glucosinolates and other lines having heat tolerance and good yield related traits.

| <u>S. No.</u> | <u>Crosses</u> |
|---------------|----------------|
| 1. ZBJ-16010 | x ZBJ-08051 |
| 2. ZBJ-17002 | x ZBJ-08051 |
| 3. ZBJ-17003 | x ZBJ-08051 |
| 4. ZBJ-17006 | x ZBJ-08051 |
| 5. ZBJ-17008 | x ZBJ-08051 |
| 6. ZBJ-17013 | x ZBJ-08051 |
| 7. ZBJ-17014 | x ZBJ-08051 |
| 8. ZBJ-17015 | x ZBJ-08051 |
| 9. ZBJ-17017 | x ZBJ-08051 |
| 10. ZBJ-17018 | x ZBJ-08051 |
| 11. ZBJ-17019 | x AARI Canola |
| 12. ZBJ-10021 | x AARI Canola |
| 13. ZBJ-11002 | x AARI Canola |
| 14. ZBJ-12011 | x AARI Canola |
| 15. ZBJ-14013 | x AARI Canola |
| 16. ZBJ-14005 | x AARI Canola |
| 17. ZBJ-17022 | x AARI Canola |
| 18. ZBJ-18001 | x AARI Canola |
| 19. ZBJ-18009 | x AARI Canola |
| 20. ZBJ-14005 | x AARI Canola |

At flowering stage, emasculation work will be done on female parents and cover with cloth bag. On next day, pollen will be obtained from covered male parent and placed on respective emasculated flowers. Silique of the successful crosses will be harvested cross-wise and threshed to get F₀ seed. This F₀ seed will be preserved to grow F₁ generation during the next sowing season.

PREVIOUS YEAR'S RESULTS

20 fresh crosses of *Brassica juncea* were made. Seed of the following successful crosses will be sown to grow F₁ generation for further studies.

| S. No. | Crosses | | |
|---------------|----------------|---|-------------|
| 1. | ZBJ-13012 | x | ZBJ-08051 |
| 2. | ZBJ-13015 | x | ZBJ-08051 |
| 3. | ZBJ-16001 | x | ZBJ-08051 |
| 4. | ZBJ-16002 | x | ZBJ-08051 |
| 5. | ZBJ-16003 | x | ZBJ-08051 |
| 6. | ZBJ-16004 | x | ZBJ-08051 |
| 7. | ZBJ-16008 | x | ZBJ-08051 |
| 8. | ZBJ-16009 | x | ZBJ-08051 |
| 9. | ZBJ-16011 | x | ZBJ-08051 |
| 10. | ZBJ-16014 | x | ZBJ-08051 |
| 11. | ZBJ-13012 | x | AARI Canola |
| 12. | ZBJ-13015 | x | AARI Canola |
| 13. | ZBJ-16001 | x | AARI Canola |
| 14. | ZBJ-16002 | x | AARI Canola |
| 15. | ZBJ-16003 | x | AARI Canola |
| 16. | ZBJ-16004 | x | AARI Canola |
| 17. | ZBJ-16008 | x | AARI Canola |
| 18. | ZBJ-16009 | x | AARI Canola |
| 19. | ZBJ-16011 | x | AARI Canola |
| 20. | ZBJ-16014 | x | AARI Canola |

2. TITLE **STUDY OF FILIAL GENERATIONS (*B. juncea*)**

OBJECTIVE To explore the genetic variability for the selection of best recombinants with desirable traits & canola quality.

RESEARCH WORKERS Mariam Hassan
Hafiz Saad Bin Mustafa
Tariq Mahmood

PROJECT DURATION Continuous nature

LOCATION

Faisalabad

TREATMENTS/
METHODOLOGY

Following breeding material will be studied in F₁ to F₆ generations.

| <u>Generation</u> | <u>Crosses</u> | <u>No. of progenies</u> |
|-------------------|----------------|---------------------------------|
| F ₁ | 20 | Whole material will be studied. |
| F ₂ | 20 | -do- |
| F ₃ | 13 | 116 |
| F ₄ | 15 | 82 |
| F ₅ | 13 | 30 |
| F ₆ | 10 | 22 |

Repeats Non-replicated

Plot size

- i. Except F₂ and F₆ 5 m (single row)
 - ii. F₂ According to availability of seed and space.
 - iii. F₆ 5 m x 0.90 m
- Fertilizer 80 : 60 : 60 NPK kg/ha
Sowing date First fortnight of Sept.2018

The segregating material will be planted in isolation tunnels to avoid any foreign pollen contamination. Selection on the basis of plant health and seed yield will be made in all generations mentioned above. Erucic acid and Glucosinolates levels of the selected plants will be determined through NIR to check the canola quality of the segregants in F₂ and F₆ generations. Plants with desired levels of Erucic acid and Glucosinolates will be sown next year to advance their respective generations.

PREVIOUS YEAR'S
RESULTS

The material studied and selected are shown below: -

| <u>Generations</u> | <u>Crosses studied</u> | <u>Progenies studied</u> | <u>Plants selected</u> |
|--------------------|------------------------|-----------------------------|------------------------|
| F ₁ | 20 | Whole material was studied. | - |
| F ₂ | 13 | -do- | 116 |
| F ₃ | 15 | 118 | 82 |
| F ₄ | 13 | 86 | 30 |
| F ₅ | 10 | 30 | 22 |
| F ₆ | 09 | 24 | 11 lines |

| | |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3. TITLE | PRELIMINARY SEED YIELD TRIAL (<i>B. juncea</i>) |
| OBJECTIVE | To evaluate the yield performance of canola quality <i>Brassica juncea</i> lines. |
| RESEARCH WORKERS | Mariam Hassan Huma Qamar Hafiz Saad Bin Mustafa Tariq Mahmood |
| PROJECT DURATION | Continuous nature |
| LOCATION | Faisalabad |
| TREATMENTS/ METHODOLOGY | <p>Entries = 15 (14 lines and 1 check) ZBJ-17002, ZBJ-17003, ZBJ-17017, ZBJ-18001, ZBJ-18002, ZBJ-18003, ZBJ-18004, ZBJ-18007, ZBJ-18008, ZBJ-18009, ZBJ-18013, ZBJ-18018, ZBJ-18022, ZBJ-18023 and AARI Canola.</p> <p>Design R.C.B. Repeats 3 Plot size 5 m x 0.90 m Row spacing 45 cm Plant spacing 15 cm Fertilizer 80 : 60 : 60 NPK kg/ha Sowing date First fortnight of September 2018. Data on plant height, number of branches/plant, days to flowering, days to maturity, 1000 seed weight and seed yield will be recorded.</p> |

| PREVIOUS YEAR'S RESULTS | <table border="0"> <thead> <tr> <th style="text-align: center;"><u>Rank</u></th> <th style="text-align: center;"><u>Varieties/Lines</u></th> <th style="text-align: center;"><u>Yield (kg/ha)</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td>ZBJ-17008</td> <td style="text-align: center;">3200</td> </tr> <tr> <td style="text-align: center;">2</td> <td>ZBJ-17015</td> <td style="text-align: center;">3146</td> </tr> <tr> <td style="text-align: center;">3</td> <td>ZBJ-17018</td> <td style="text-align: center;">3120</td> </tr> <tr> <td style="text-align: center;">4</td> <td>ZBJ-17006</td> <td style="text-align: center;">3108</td> </tr> <tr> <td style="text-align: center;">5</td> <td>ZBJ-17022</td> <td style="text-align: center;">3066</td> </tr> <tr> <td style="text-align: center;">10</td> <td>AARI Canola (C)</td> <td style="text-align: center;">2687</td> </tr> <tr> <td style="text-align: center;">17</td> <td>ZBJ-16012</td> <td style="text-align: center;">2497</td> </tr> <tr> <td></td> <td style="text-align: center;">LSD 5%</td> <td style="text-align: center;">195</td> </tr> </tbody> </table> | <u>Rank</u> | <u>Varieties/Lines</u> | <u>Yield (kg/ha)</u> | 1 | ZBJ-17008 | 3200 | 2 | ZBJ-17015 | 3146 | 3 | ZBJ-17018 | 3120 | 4 | ZBJ-17006 | 3108 | 5 | ZBJ-17022 | 3066 | 10 | AARI Canola (C) | 2687 | 17 | ZBJ-16012 | 2497 | | LSD 5% | 195 |
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| <u>Rank</u> | <u>Varieties/Lines</u> | <u>Yield (kg/ha)</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | ZBJ-17008 | 3200 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | ZBJ-17015 | 3146 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | ZBJ-17018 | 3120 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | ZBJ-17006 | 3108 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | ZBJ-17022 | 3066 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | AARI Canola (C) | 2687 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | ZBJ-16012 | 2497 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | LSD 5% | 195 | | | | | | | | | | | | | | | | | | | | | | | | | | |

4. TITLE ADVANCED SEED YIELD TRIAL (*B. juncea*)

OBJECTIVE To test yield performance of promising *B. juncea* lines.

RESEARCH WORKERS Mariam Hassan
Hafiz Saad Bin Mustafa
Tariq Mahmood

PROJECT DURATION Continuous nature

LOCATION Faisalabad

**TREATMENTS/
METHODOLOGY** Entries = 13 (12 lines and 1 check)
ZBJ-16002, ZBJ-16008, ZBJ-16010, ZBJ-16011,
ZBJ-17006, ZBJ-17008, ZBJ-17013, ZBJ-17014,
ZBJ-17015, ZBJ-17018, ZBJ-17019, ZBJ-17022
and AARI Canola.

Design R.C.B.
Repeats 3
Plot size 5 m x 1.35 m
Row spacing 45 cm
Plant spacing 15 cm
Fertilizer 80: 60 : 60 NPK kg/ha
Sowing date First fortnight of September 2018.
Data on plant height, number of branches/plant, days to flowering, days to maturity, 1000 seed weight and seed yield will be recorded.

PREVIOUS YEAR'S RESULTS

| <u>Rank</u> | <u>Varieties/Lines</u> | <u>Yield (kg/ha)</u> |
|-------------|------------------------|----------------------|
| 1 | ZBJ-13015 | 3264 |
| 2 | ZBJ-15023 | 3172 |
| 3 | ZBJ-16014 | 2969 |
| 4 | ZBJ-16009 | 2878 |
| 5 | ZBJ-16001 | 2846 |
| 11 | AARI Canola (C) | 2616 |
| 13 | ZBJ-16004 | 2348 |
| | LSD 5% | 281 |

5. TITLE MICRO SEED YIELD TRIAL (*B. juncea*)

OBJECTIVE To study the performance of promising lines at different agro climatic conditions of the Punjab.

RESEARCH WORKERS Hafiz Saad Bin Mustafa

Dr. Sundas Shahzad
Tariq Mahmood

PROJECT DURATION

Continuous nature

LOCATION

Sites = 5 viz; (Faisalabad, Bahawalpur, Khanpur, Karor and Piplan).

**TREATMENTS/
METHODOLOGY**

Entries = 10 (9 lines with 1 check)
ZBJ-10021, ZBJ-11002,ZBJ-13015,ZBJ-15023,
ZBJ-16001, ZBJ-16003, ZBJ-16009,ZBJ-16014,
ZBJ-14017and AARI Canola.

Design R.C.B.

Repeats 3

Plot size 5 m x 1.80 m

Row spacing 45 cm

Plant spacing 15 cm

Fertilizer 80 : 60 : 60 NPK kg/ha

Sowing date First fortnight of September 2018.

Data on plant height, number of branches/plant, days to flowering, days to maturity, 1000 seed weight and seed yield will be recorded.

**PREVIOUS YEAR'S
RESULTS**

Seed of 11 entries was sent to five locations. The results received are as follows: -

| Rank | Line/ Variety | F/Abad | Bahawalpur | Piplan | Khanpur | Karor | Average |
|---------------|-----------------|--------|------------|--------|---------|-------|---------|
| 1 | ZBJ-12011 | 2978 | 1248 | 1445 | 1555 | 2595 | 1964 |
| 2 | ZBJ-10021 | 2915 | 1273 | 1486 | 1466 | 2325 | 1893 |
| 3 | ZBJ-11002 | 2962 | 1210 | 1357 | 1037 | 2840 | 1881 |
| 4 | ZBJ-14017 | 2905 | 1029 | 1482 | 1274 | 2711 | 1880 |
| 5 | ZBJ-14013 | 3243 | 1176 | 1259 | 1555 | 1991 | 1845 |
| 6 | ZBJ-14005 | 2880 | 1212 | 1216 | 1066 | 2720 | 1819 |
| 7 | ZBJ-15020 | 2834 | 1004 | 1289 | 1496 | 2134 | 1751 |
| 8 | ZBJ-15018 | 2675 | 918 | 1495 | 1437 | 2222 | 1749 |
| 9 | ZBJ-13012 | 3182 | 1278 | 1193 | 1452 | 1569 | 1735 |
| 10 | ZBJ-13006 | 2852 | 1209 | 1163 | 1318 | 2106 | 1730 |
| 11 | AARI Canola (C) | 2621 | 1032 | 1230 | 1037 | 1378 | 1459 |
| LSD 5% | | 295 | 242 | 117 | 199 | 369 | |

B. WINTER RAPESEED, FAISALABAD

6. TITLE **HYBRIDIZATION PROGRAMME (*B. napus*)**

OBJECTIVE To make fresh crosses for the development of with high yielding variety with canola quality oil.

RESEARCH WORKERS Dr Sundas Shahzad
Mariam Hassan
Huma Qamar
Tariq Mahmood

PROJECT DURATION Continuous nature
LOCATION Faisalabad

TREATMENTS/
METHODOLOGY Following crosses will be made by keeping RBN-13028 as male parent, having canola quality, high yielding & lodging resistant traits.

| <u>S. No.</u> | <u>Crosses</u> |
|----------------|----------------|
| 1. Con-II | x RBN-13028 |
| 2. RBN-16001 | x RBN-13028 |
| 3. RBN-16008 | x RBN-13028 |
| 4. RBN-16011 | x RBN-13028 |
| 5. RBN-16014 | x RBN-13028 |
| 6. RBN-17001 | x RBN-13028 |
| 7. RBN-17003 | x RBN-13028 |
| 8. RBN-17004 | x RBN-13028 |
| 9. RBN- 17011 | x RBN-13028 |
| 10. RBN- 17014 | x RBN-13028 |

At flowering stage, emasculation work will be done on female parents and cover with cloth bag. On next day, pollen will be obtained from covered male parent and placed on respective emasculated flowers. Silique of the successful crosses will be harvested cross-wise and threshed to get F₀ seed. This F₀ seed will be preserved to grow F₁ generation during the next sowing season.

PREVIOUS YEAR'S RESULTS Fourteen fresh crosses were made. Seed of the following successful crosses will be sown to grow F₁ generation for further studies.

| <u>Sr. No.</u> | | <u>Crosses</u> |
|----------------|------------|----------------|
| 1 | KN-256 | x RBN-13029 |
| 2 | KN- 263 | x RBN-13029 |
| 3 | KN- 265 | x RBN-13029 |
| 4 | SONG-2 | x RBN-13029 |
| 5 | RBN-13012 | x RBN-13029 |
| 6 | RBN-13015 | x RBN-13029 |
| 7 | RBN-13017 | x RBN-13029 |
| 8 | RBN-13022 | x RBN-13029 |
| 9 | RBN-13028 | x RBN-13029 |
| 10 | RBN-14008 | x RBN-13029 |
| 11 | RBN- 14013 | x RBN-13029 |
| 12 | RBN- 14017 | x RBN-13029 |
| 13 | RBN- 14030 | x RBN-13029 |
| 14 | RBN- 14034 | x RBN-13029 |

7. TITLE **STUDY OF FILIAL GENERATIONS**
(*B. napus*)

OBJECTIVE Development of varieties for higher seed yield along with canola quality characteristics.

RESEARCH WORKERS Huma Qamar
Dr Sundas Shahzad
Mariam Hassan
Tariq Mahmood

PROJECT DURATION Continuous nature

LOCATION Faisalabad

**TREATMENTS/
METHODOLOGY** Following filial generations will be studied from F₁ to F₇ generations.

| Generation | Crosses | Progenies |
|-------------------|----------------|------------------|
| F ₁ | 14 | - |
| F ₂ | 12 | - |
| F ₃ | 10 | 53 |
| F ₄ | 09 | 59 |
| F ₅ | 04 | 35 |
| F ₆ | 10 | 60 |
| F ₇ | 09 | 43 |

| | |
|---------------------------------------------|----------------------------------------------|
| Repeats | Non-replicated |
| Plot size | |
| i. Except F ₂ and F ₇ | 5 m (single row) |
| ii. F ₂ | According to availability of seed and space. |
| F ₇ | 5 m x 0.90m |
| Fertilizer | 90 : 85 :60 NPK kg/ha |
| Sowing date | First fortnight of Oct. 2018. |

The segregating material will be planted in isolation tunnels to avoid any foreign pollen contamination. Selection on the basis of plant health and seed yield will be made in all generations mentioned above. Erucic acid and Glucosinolates levels of the selected plants will be determined through NIR to check the canola quality of the segregants in F₂ through F₇ generations. Plants with desired levels of Erucic acid and Glucosinolates will be sown next year to advance their respective generations.

The material studied and selected are shown below: -

PREVIOUS YEAR'S RESULTS

| Generations | No. of crosses studied | No. of Crosses Bulked | No. of plants selected |
|----------------|------------------------|-----------------------|------------------------|
| F ₁ | 12 | - | Whole material |
| F ₂ | 10 | Whole material | 53 |
| F ₃ | 09 | 48 | 59 |
| F ₄ | 04 | 47 | 35 |
| F ₅ | 10 | 37 | 60 |
| F ₆ | 09 | 45 | 43 |
| F ₇ | 06 | 26 | - |

| | |
|------------------|-------------------------------------------------------------------------------|
| 8. TITLE | PRELIMINARY YIELD TRIAL (<i>B. napus</i>) |
| OBJECTIVE | To study the yield performance of canola quality <i>Brassica napus</i> lines. |
| RESEARCH WORKERS | Dr. Sundas Shahzad Mariam Hassan Tariq Mahmood |
| PROJECT DURATION | Continuous nature |

LOCATION Faisalabad

TREATMENTS/
METHODOLOGY Entries = 14viz; (13 lines with 1 check)
RBN-18001, RBN-18002, RBN-18003, RBN-18004,
RBN-18006, RBN-18007, RBN-18008, RBN-18009,
RBN-18010, RBN-18011, RBN-18012, RBN-18013,
RBN-18021 and Super Canola.
Design R.C.B.
Repeats 3
Plot size 5 m x 0.90 m
Row spacing 45 cm
Plant spacing 15 cm
Fertilizer 90 : 85 : 60 NPK kg/ha
Sowing date First fortnight of October,
2018.

Data on plant height, number of branches/plant, days to flowering, days to maturity, 1000 seed weight and seed yield will be recorded.

PREVIOUS YEAR'S
RESULTS

| <u>Rank</u> | <u>Varieties/Lines</u> | <u>Yield (kg/ha)</u> |
|-------------|------------------------|--------------------------|
| 1 | RBN-17014 | 3367 |
| 2 | RBN-17003 | 3126 |
| 3 | RBN-17001 | 2959 |
| 4 | RBN-17004 | 2907 |
| 5 | Faisal canola (C) | 2744 |
| 11 | RBN-17017 | 1715 |
| | LSD 5% | 269 |

9. TITLE ADVANCED YIELD TRIAL (*B. napus*)

OBJECTIVE To study the yield performance of canola quality
Brassica napus lines.

RESEARCH WORKERS Dr. Sundas Shahzad
Mariam Hassan
Huma Qamar
Tariq Mahmood

PROJECT DURATION Continuous nature

LOCATION Faisalabad

Design R.C.B.
Repeats 3
Plot size 5 m x 1.35 m
Row spacing 45 cm

Plant spacing 15 cm
 Fertilizer 90 : 85 : 60 NPK kg/ha
 Sowing date First fortnight of October, 2018.
 Data on plant height, number of branches/plant,
 days to flowering, days to maturity, 1000 seed
 weight and seed yield will be recorded.

| PREVIOUS YEAR'S RESULTS | <u>Rank</u> | <u>Varieties/Lines</u> | <u>Yield (kg/ha)</u> |
|-------------------------|-------------|------------------------|----------------------|
| | 1 | RBN-16001 | 3603 |
| | 2 | RBN-16008 | 3479 |
| | 3 | RBN-16011 | 3237 |
| | 7 | Faisal Canola (C) | 2417 |
| | 10 | Rohi sarson(C) | 1724 |
| | | LSD 5% | 280 |

10. TITLE MICRO YIELD TRIAL OF RAPESEED

OBJECTIVE To study the performance of new strains over different agro climatic conditions of the Punjab.

RESEARCH WORKERS Hafiz Saad bin Mustafa
 Dr. Sundas Shahzad
 Tariq Mahmood

PROJECT DURATION Continuous nature

LOCATION Sites = 08 viz;
 Faisalabad, Bahawalpur, Khanpur, Piplan,
 Chakwal, Mandi Bahauddin, Karor and Fateh
 jang

TREATMENTS/ METHODOLOGY Entries = 10 (9 lines and one check) viz;
 RBN-13022, RBN-16001, RBN-16008,
 RBN-16011, 16CBN002, 16CBN007, KN-279,
 KN-294, KN-309 and Super Canola.

Design R.C.B.
 Repeats 3
 Plot size 5 m x 1.80 m
 Row spacing 45 cm
 Fertilizer 90 : 85 : 60 NPK kg/ha
 Sowing date First fortnight of October, 2018.

Data on plant height, number of branches/plant, days to flowering, days to maturity, 1000 seed weight and seed yield will be recorded.

PREVIOUS YEAR'S RESULTS

Seed of 9 entries was sent to seven locations. The results received are as follows: -

Seed yield in kg/ha of Micro Yield Trial *B. napus*

| Sr. No. | Line/Variety | FSD | B/nagr | B/pur | M.B. Din | K/pur | Karore | Piplan | Avg. |
|---------|-------------------|------|--------|-------|----------|-------|--------|--------|------|
| 1 | RBN-13017 | 3215 | 2749 | 2597 | 2527 | 1922 | 2333 | 2172 | 2502 |
| 2 | RBN-13016 | 2915 | 2524 | 2422 | 2020 | 1684 | 2555 | 1806 | 2275 |
| 3 | KN-279 | 2776 | 2270 | 2474 | 1783 | 1867 | 3207 | 1352 | 2247 |
| 4 | KN-294 | 2722 | 2518 | 1797 | 1864 | 2379 | 2844 | 1481 | 2229 |
| 5 | RBN-13022 | 2863 | 2109 | 2222 | 1739 | 2123 | 2363 | 1954 | 2196 |
| 6 | Faisal Canola (C) | 2696 | 2057 | 2419 | 2282 | 2049 | 2414 | 1407 | 2189 |
| 7 | RBN-13015 | 2719 | 2086 | 1830 | 2091 | 1793 | 2159 | 1352 | 2004 |
| 8 | 15CBN-010 | 2420 | 2314 | 2148 | 1285 | 1958 | 2096 | 1574 | 1971 |
| 9 | 15CBN-006 | 1852 | 2017 | 1848 | 948 | 1627 | 1888 | 1361 | 1649 |
| | LSD 5% | 277 | 165 | 153 | 223 | 228 | 245 | 104 | |

11. TITLE

NATIONAL UNIFORM RAPESEED YIELD TRIALS

OBJECTIVE

To evaluate the performance of different mustard promising lines under Faisalabad conditions.

RESEARCH WORKERS

Huma Qamar
Mariam Hassan
Hafiz Saad Bin Mustafa
Tariq Mahmood

PROJECT DURATION

Continuous nature

LOCATION

Faisalabad

**TREATMENTS/
METHODOLOGY**

Received from PARC through Cooperative Programme (Two promising line of this institute will also be got included in these trials).

Lay out will be done according to instructions received with the material.

PREVIOUS YEAR'S RESULTS

Uniform Rapeseed yield trial with 22 coded entries received from PARC, Islamabad were conducted during Rabi, 2017-18.

Seed yield kg/ha of Rapeseed entries in NURYT from Twelve locations during Rabi 2017-2018

| Rank | Entry Name | NARC Isd | BARI Chk | ORI Fsd | RARI B-pur | Pioneer Sahiwal | ORS Khanpur | BARS Fatehjang | AZRC DIKhan | AZRI Bhakar | NIFA Peshawar | ARI T-jam | ARI Quetta | Mean |
|------|----------------------|-------------|------------|-------------|-------------|-----------------|-------------|----------------|-------------|-------------|---------------|-------------|------------|------|
| 1 | KN-279 | 2782 | 562 | 2567 | 3400 | 2911 | 1315 | 767 | 2831 | 2207 | 2289 | 1423 | 760 | 1985 |
| 2 | KN-294 | 2580 | 642 | 3019 | 3278 | 3328 | 889 | 567 | 2395 | 2170 | 2045 | 1828 | 483 | 1935 |
| 3 | MUN-1 | 2582 | 623 | 2315 | 2978 | 3289 | 1167 | 681 | 2479 | 2756 | 2282 | 845 | 1042 | 1920 |
| 4 | HC-021C | 3189 | 612 | 2663 | 2892 | 2628 | 926 | 499 | 1876 | 1804 | 3516 | 953 | 1196 | 1896 |
| 5 | WS-520 | 3242 | 446 | 1880 | 1850 | 2878 | 781 | 640 | 3021 | 3367 | 2608 | 906 | 1116 | 1895 |
| 6 | CHS-2 | 3311 | 975 | 2428 | 2389 | 2633 | 1148 | 681 | 2795 | 2111 | 2476 | 905 | 838 | 1891 |
| 7 | RR-41-4 | 2801 | 633 | 2274 | 2811 | 3200 | 1222 | 711 | 2343 | 2431 | 2312 | 1419 | 487 | 1887 |
| 8 | RBN-13028 | 2851 | 753 | 2969 | 2661 | 2711 | 1444 | 770 | 1994 | 1944 | 2236 | 1265 | 969 | 1881 |
| 9 | 011-K-16-3 | 3203 | 489 | 2374 | 3228 | 2522 | 1019 | 631 | 2188 | 2074 | 2536 | 1376 | 824 | 1872 |
| 10 | Kingola | 3026 | 761 | 2294 | 2100 | 2028 | 796 | 499 | 2807 | 3067 | 2925 | 1136 | 511 | 1829 |
| 11 | Hyola-401 (C) | 3051 | 544 | 2354 | 2644 | 2306 | 1074 | 624 | 2380 | 1404 | 3053 | 1228 | 865 | 1794 |
| 12 | CHS-9 | 2759 | 839 | 2480 | 2006 | 2467 | 963 | 686 | 2410 | 1915 | 2779 | 928 | 644 | 1740 |
| 13 | Chakwal Sarson | 2213 | 508 | 2174 | 3333 | 2544 | 722 | 358 | 1922 | 2344 | 2060 | 1756 | 888 | 1735 |
| 14 | MUN-2 | 2537 | 646 | 2430 | 2617 | 2817 | 1167 | 710 | 1932 | 2000 | 2231 | 1019 | 635 | 1728 |
| 15 | HC-022B | 2458 | 637 | 2669 | 2283 | 2761 | 722 | 444 | 1909 | 1684 | 2982 | 1150 | 766 | 1705 |
| 16 | CHS-16 | 2674 | 569 | 1817 | 2311 | 2778 | 981 | 458 | 2359 | 2067 | 2127 | 1208 | 874 | 1685 |
| 17 | 14CBN-009 | 2390 | 609 | 2100 | 3378 | 3133 | 1204 | 762 | 1842 | 2037 | 1027 | 1067 | 653 | 1684 |
| 18 | Faisal Canola (C) | 2543 | 679 | 1991 | 2489 | 2156 | 1259 | 470 | 2446 | 2111 | 2042 | 1234 | 687 | 1676 |
| 19 | RBN-13029 | 2498 | 614 | 2239 | 2122 | 2483 | 1296 | 564 | 2380 | 1522 | 2030 | 1385 | 813 | 1662 |
| 20 | MUN-3 | 2532 | 557 | 2043 | 1739 | 3206 | 1056 | 628 | 1934 | 1922 | 1946 | 886 | 1010 | 1622 |
| 21 | 14CBN-001 | 2428 | 499 | 2215 | 2047 | 2583 | 1185 | 435 | 2099 | 1356 | 1508 | 1289 | 846 | 1541 |
| 22 | MUN-4 | 2528 | 744 | 1731 | 1556 | 2172 | 1148 | 478 | 1900 | 1859 | 2016 | 1025 | 569 | 1477 |
| | Location mean | 2735 | 634 | 2319 | 2551 | 2706 | 1068 | 594 | 2284 | 2098 | 2319 | 1192 | 794 | |

C. WINTER MUSTARD, FAISALABAD

12. TITLE

HYBRIDIZATION PROGRAMME (*Brassica juncea*)

OBJECTIVE

To make fresh crosses for canola quality variety development.

RESEARCH WORKERS

Dr. Sundas Shahzad
Mariam Hassan
Tariq Mahmood

PROJECT DURATION
LOCATION

Continuous nature
Faisalabad

TREATMENTS/
METHODOLOGY

Following crosses will be made keeping ZBJ-08051 and AARI Canola (low Erucic acid and low Glucosinolates source) as male parents.

| <u>S. No.</u> | | <u>Crosses</u> |
|---------------|-----------|----------------|
| 1. | 45S42 | x ZBJ-08051 |
| 2. | RBJ-17004 | x ZBJ-08051 |
| 3. | RBJ-17005 | x ZBJ-08051 |
| 4. | RBJ-17010 | x ZBJ-08051 |
| 5. | RBJ-17013 | x ZBJ-08051 |
| 6. | JK-2018 | x ZBJ-08051 |
| 7. | RBJ-17021 | x ZBJ-08051 |
| 8. | KJ-244 | x ZBJ-08051 |
| 9. | BRJ-1405 | x ZBJ-08051 |
| 10. | HMU-322B | x ZBJ-08051 |
| 11. | 45S42 | x AARI Canola |
| 12. | RBJ-17004 | x AARI Canola |
| 13. | RBJ-17005 | x AARI Canola |
| 14. | RBJ-17010 | x AARI Canola |
| 15. | RBJ-17013 | x AARI Canola |
| 16. | Jk-2018 | x AARI Canola |
| 17. | RBJ-17021 | x AARI Canola |
| 18. | KJ-244 | x AARI Canola |
| 19. | BRJ-140 | x AARI Canola |
| 20. | HMU-322B | x AARI Canola |

At flowering stage, emasculation work will be done on female parents and cover with cloth bag. On next day, pollen will be obtained from covered male parent and placed on respective emasculated flowers. Silique of the successful crosses will be harvested cross-wise and threshed to get F₀ seed. This F₀ seed will be preserved to grow F₁ generation during the next sowing season.

PREVIOUS YEAR'S
RESULTS

Thirteen fresh crosses were made. Seed of the following successful crosses will be sown to grow F₁ generation for further studies

| <u>S. No.</u> | | <u>Crosses</u> |
|---------------|-----------|----------------|
| 1. | RBJ-15786 | x ZBJ-08051 |
| 2. | RBJ-16012 | x ZBJ-08051 |
| 3. | RBJ-16007 | x ZBJ-08051 |

| | | | |
|-----|------------|---|-----------|
| 4. | RBJ-14017 | x | ZBJ-08051 |
| 5. | RBJ-16004 | x | ZBJ-08051 |
| 6. | RBJ-15018 | x | ZBJ-08051 |
| 7. | BRJ-1304 | x | ZBJ-08051 |
| 8. | 14CBJ004 | x | ZBJ-08051 |
| 9. | Super Raya | x | ZBJ-08051 |
| 10. | RBJ-15013 | x | ZBJ-08051 |
| 11. | RBJ-15017 | x | ZBJ-08051 |
| 12. | KJ-238 | x | ZBJ-08051 |
| 13. | Sindh Raya | x | ZBJ-08051 |

13. TITLE

**STUDY OF FILIAL GENERATIONS
(*B. juncea*)**

OBJECTIVE

Development of varieties for higher seed yield along with canola quality characteristics.

RESEARCH WORKERS

Dr. Sundas Shahzad
Mariam Hassan
Tariq Mahmood

PROJECT DURATION

Continuous nature

LOCATION

Faisalabad

**TREATMENTS/
METHODOLOGY**

Following breeding material will be studied in F1 to F6 generations.

| Generation | Crosses | Progenies |
|---------------------------------------------|----------------------------------------------|------------------|
| F ₁ | 13 | - |
| F ₂ | 12 | - |
| F ₃ | 10 | 98 |
| F ₄ | 10 | 66 |
| F ₅ | 12 | 50 |
| F ₆ | 11 | 25 |
| F ₇ | 8 | 23 |
| Repeats | Non-replicated | |
| Plot size | | |
| i. Except F ₂ and F ₇ | 5 m (single row) | |
| ii. F ₂ | According to availability of seed and space. | |
| F ₇ | 5 m x 0.90m | |
| Fertilizer | 90 : 85 : 60 NPK kg/ha | |
| Sowing date | First fortnight of October,2018 | |

The segregating material will be planted in

isolation tunnels to avoid any foreign pollen contamination. Selection on the basis of plant health and seed yield will be made in all generations mentioned above. Erucic acid and Glucosinolates levels of the selected plants will be determined to check the canola quality of the segregants in F₂ through F₇ generations. Plants with desired levels of Erucic acid and Glucosinolates will be sown next year to advance their respective generations.

PREVIOUS YEAR'S RESULTS

The material studied and selected are shown below: -

| <u>Generation</u> | <u>Crosses studied</u> | <u>Progenies Studied</u> | <u>Plants selected</u> |
|-------------------|------------------------|--------------------------|------------------------|
| F ₁ | 12 | - | - |
| F ₂ | 10 | - | 98 |
| F ₃ | 10 | 92 | 66 |
| F ₄ | 12 | 76 | 50 |
| F ₅ | 11 | 30 | 25 |
| F ₆ | 8 | 24 | 23 |
| F ₇ | 5 | 20 | (10 lines) |

14. TITLE

PRELIMINARY YIELD TRIAL (*B. juncea*)

OBJECTIVE

To study the performance of new lines of *B. juncea* for their seed yield.

RESEARCH WORKERS

Huma Qamar
Dr. Sundas Shahzad
Mariam Hassan
Tariq Mahmood

PROJECT DURATION

Continuous nature

LOCATION

Faisalabad

**TREATMENTS/
METHODOLOGY**

Entries = 11 (10 lines and 1 check)

RBJ-18002, RBJ-18003, RBJ-18004
RBJ-18007, RBJ-18008, RBJ-18009,
RBJ-18010, RBJ-18011, RBJ-18015,
RBJ-18017 and Super Raya

Design R.C.B.
Repeats 3

Plot size 5 m x 0.90 m
 Row spacing 45 cm
 Plant spacing 15 cm
 Fertilizer 90 : 85 : 60 NPK kg/ha
 Sowing date First fortnight of October, 2018.
 Data on plant height, number of branches/plant, days to flowering, days to maturity, 1000 seed weight and seed yield will be recorded.

PREVIOUS YEAR'S RESULTS

| <u>Rank</u> | <u>Varieties/Lines</u> | <u>Yield (kg/ha)</u> |
|-------------|------------------------|----------------------|
| 1 | RBJ-17010 | 4378 |
| 2 | RBJ-17013 | 4348 |
| 3 | RBJ-17005 | 4189 |
| 8 | Super Raya | 3978 |
| 13 | RBJ-17017 | 3011 |
| | LSD 5% | 292 |

15. TITLE ADVANCED YIELD TRIAL (*B. juncea*)

OBJECTIVE To test the promising lines for their yield performance.

RESEARCH WORKERS Dr. Sundas Shahzad
 Mariam Hassan
 Tariq Mahmood

PROJECT DURATION Continuous nature

LOCATION Faisalabad

TREATMENTS/METHODOLOGY Entries = 14 (13 lines and 1 check)

RBJ-14017, RBJ-15013, RBJ-15017, RBJ-15018, RBJ-16007, RBJ-16012, RBJ-17003, RBJ-17004, RBJ-17005, RBJ-17010, RBJ-17013, RBJ-17015, RBJ-17021 and Super Raya.

Design R.C.B.
 Repeats 3
 Plot size 5 m x 1.35 m
 Row spacing 45 cm
 Plant spacing 15 cm
 Fertilizer 90 : 85 : 60 NPK kg/ha
 Sowing date First fortnight of October, 2018.
 Data on plant height, number of branches/plant, days to flowering, days to maturity, 1000 seed

weight and seed yield will be recorded.

PREVIOUS YEAR'S RESULTS

| <u>Rank</u> | <u>Varieties/Lines</u> | <u>Yield (kg/ha)</u> |
|-------------|------------------------|----------------------|
| 1. | RBJ-15015 | 3817 |
| 2. | RBJ-14010 | 3770 |
| 3. | RBJ-15019 | 3768 |
| 10. | Khanpur Raya (C) | 3314 |
| 12. | Super Raya (C) | 3175 |
| 14. | RBJ-16020 | 2709 |
| | LSD 5% | 365 |

16. TITLE

MICRO YIELD TRIALS OF MUSTARD

OBJECTIVE

To study the yield performance of promising lines at different agro climatic conditions of the Punjab.

RESEARCH WORKERS

Hafiz Saad Bin Mustafa
Dr. Sundas Shahzad
Tariq Mahmood

PROJECT DURATION

Continuous nature

LOCATION

Sites = 8viz;
ORI Faisalabad, Bahawalpur, Khanpur, Piplan, Chakwal, Fateh jang, Mandi bahudin and Karor.

**TREATMENTS/
METHODOLOGY**

Entries = 14viz;
RBJ-15015, RBJ-14010, RBJ-15019,
ZBJ-12011, 15CBJ001, 15CBJ007, 16CBJ001,
16CBJ006, KJ-238, KJ-244,
KJ-258, BRJ-1452, BRJ-1458 and Super Raya.

Design R.C.B.
Repeats 3
Plot size 5 m x 1.80 m
Row spacing 45 cm
Plant spacing 15 cm
Fertilizer 90 : 85 : 60 NPK kg/ha
Sowing date First fortnight of October, 2018.
Data on plant height, number of branches/plant, days to flowering, days to maturity, 1000 seed weight and seed yield will be recorded.

PREVIOUS YEAR'S RESULTS

Seed of 9 entries was sent to seven locations. The results received are as follows: -

Seed yield in kg/ha of Micro Yield Trial *B. juncea*

| Rank | Line/Variety | FSD | B/nagr | BWP | M.B. Din | K/pur | Karore | Piplan | Avg. |
|------|--------------|------|--------|------|----------|-------|--------|--------|------|
| 1 | RBJ-15016 | 3256 | 1960 | 2047 | 1977 | 2218 | 2944 | 2339 | 2392 |
| 2 | RBJ-15786 | 2804 | 1893 | 2357 | 1592 | 2087 | 2985 | 2417 | 2305 |
| 3 | KJ-244 | 2881 | 1677 | 2478 | 1460 | 2196 | 2611 | 2028 | 2190 |
| 4 | BRJ-1405 | 2848 | 1658 | 2698 | 1586 | 2130 | 2467 | 1944 | 2190 |
| 5 | BRJ-1451 | 3072 | 1624 | 2447 | 1559 | 2394 | 2441 | 1713 | 2179 |
| 6 | Super Raya | 2689 | 1575 | 2426 | 1861 | 1944 | 2481 | 2019 | 2142 |
| 7 | KJ-238 | 2657 | 1634 | 1844 | 1600 | 2109 | 2911 | 1898 | 2093 |
| 8 | RBJ-14011 | 2780 | 1756 | 1844 | 1719 | 1574 | 2574 | 2194 | 2063 |
| 9 | RBJ-14012 | 2937 | 1696 | 1950 | 1543 | 1669 | 2641 | 1565 | 2000 |
| | LSD 5% | 260 | 145 | 159 | 168 | 220 | 282.9 | 140 | |

17. TITLE

NATIONAL UNIFORM MUSTARD YIELD TRIALS

OBJECTIVE

To evaluate the performance of different mustard promising lines under Faisalabad conditions.

RESEARCH WORKERS

Mariam Hassan
Hafiz Saad Bin Mustafa
Tariq Mahmood

PROJECT DURATION

Continuous nature

LOCATION

Faisalabad

**TREATMENTS/
METHODOLOGY**

Received from PARC through Cooperative Programme.

Lay out will be done according to instructions received with the material.

**PREVIOUS YEAR'S
RESULTS**

National Uniform Mustard yield trial with 16 coded entries received from PARC, Islamabad were conducted during Rabi, 2017-18.

Seed yield kg/ha of Mustard entries in NUMYT from Twelve locations

| Rank | Entry Name | NARC Isd | BARI Chk | ORI Fsd | RARI B-pur | Pioneer Sahiwal | ORS Khanpur | BARS Fatehjang | AZRC DIKhan | AZRI Bhakar | NIFA Peshawar | ARI T-jam | ARI Quetta | Mean |
|------|------------|----------|----------|---------|------------|-----------------|-------------|----------------|-------------|-------------|---------------|-----------|------------|------|
| 1 | HMU-322B | 2392 | 717 | 3374 | 3328 | 3867 | 1519 | 547 | 2509 | 2509 | 2933 | 1544 | 814 | 2171 |

| | | | | | | | | | | | | | | |
|----------------------|----------------|-------------|------------|-------------|-------------|-------------|-------------|------------|-------------|-------------|-------------|-------------|------------|------|
| 2 | Coral-432 (C) | 2670 | 646 | 3293 | 3028 | 3100 | 1593 | 468 | 2437 | 2437 | 3680 | 1799 | 572 | 2144 |
| 3 | KJ-238 | 2548 | 528 | 3120 | 2472 | 3306 | 1741 | 476 | 2907 | 2907 | 3071 | 1654 | 740 | 2123 |
| 4 | HMU-321 A | 2822 | 407 | 3620 | 2567 | 3467 | 1444 | 567 | 2741 | 2741 | 2988 | 1573 | 414 | 2113 |
| 5 | MM-31-3 | 2550 | 631 | 3102 | 3256 | 2961 | 1574 | 494 | 1895 | 1895 | 3458 | 1720 | 1037 | 2048 |
| 6 | Super Raya (C) | 2562 | 507 | 2817 | 2378 | 2461 | 1889 | 523 | 2886 | 2886 | 3375 | 1389 | 488 | 2013 |
| 7 | MM-31-5 | 2402 | 547 | 3065 | 2378 | 2872 | 1630 | 634 | 2572 | 2572 | 2877 | 1546 | 978 | 2006 |
| 8 | A5S35 | 2708 | 504 | 3396 | 1883 | 3750 | 1407 | 649 | 2441 | 2441 | 2794 | 1429 | 433 | 1986 |
| 9 | 13CBI-004 | 2409 | 620 | 3020 | 2789 | 2111 | 1796 | 444 | 2632 | 2632 | 2545 | 1558 | 1048 | 1967 |
| 10 | BRJ-1304 | 2337 | 708 | 2746 | 2156 | 2767 | 1463 | 595 | 2767 | 2767 | 3154 | 1441 | 603 | 1959 |
| 11 | BRJ-1104 | 2317 | 578 | 3185 | 2850 | 3006 | 1519 | 561 | 2243 | 2243 | 2767 | 1300 | 618 | 1932 |
| 12 | KJ-221 | 2448 | 519 | 2954 | 2183 | 3050 | 1648 | 526 | 2380 | 2380 | 2905 | 1227 | 683 | 1909 |
| 13 | MS-17 | 2466 | 564 | 2893 | 2233 | 3406 | 759 | 664 | 2502 | 2502 | 2490 | 1295 | 770 | 1879 |
| 14 | MS-15 | 2447 | 441 | 3170 | 1761 | 2917 | 1278 | 294 | 2652 | 2652 | 2711 | 1292 | 891 | 1876 |
| 15 | GALAXY | 2496 | 429 | 2656 | 2544 | 2383 | 1574 | 469 | 2255 | 2255 | 2850 | 1762 | 426 | 1842 |
| 16 | 13CBI-006 | 2333 | 680 | 2243 | 1894 | 2694 | 1463 | 526 | 2073 | 2073 | 2518 | 1107 | 506 | 1676 |
| Location mean | | 2494 | 564 | 3041 | 2481 | 3007 | 1519 | 527 | 2493 | 2493 | 2945 | 1477 | 689 | |

| | | | | | | | | | | | |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------|--------------|---|------------|--------------------|-----------|--------------|--------------------|-------|
| 18. TITLE | EFFECT OF SULPHUR ON THE YIELD OF RAPESEED & MUSTARD | | | | | | | | | | |
| OBJECTIVE | To evaluate the efficacy of Sulphur at different doses regarding yield enhancement. | | | | | | | | | | |
| RESEARCH WORKERS | Muhammad Rizwan Khurshid | | | | | | | | | | |
| PROJECT DURATION | Rabi 2018-19 | | | | | | | | | | |
| LOCATION | Faisalabad | | | | | | | | | | |
| TREATMENTS | 1) Control (No Sulphur Application) Varieties 2) 4 Kg/ac at flowering i) AARI Canola 3) 6 Kg/ac at flowering ii) Faisal Canola 4) 8 Kg/ac at flowering iii) Super Raya | | | | | | | | | | |
| METHODOLOGY | <table border="0"> <tr> <td>Design</td> <td>Split plot</td> </tr> <tr> <td>Replications</td> <td>3</td> </tr> <tr> <td>Fertilizer</td> <td>90-85-60 NPK kg/ha</td> </tr> <tr> <td>Plot size</td> <td>5 m x 1.80 m</td> </tr> <tr> <td>Row to Row spacing</td> <td>45 cm</td> </tr> </table> | Design | Split plot | Replications | 3 | Fertilizer | 90-85-60 NPK kg/ha | Plot size | 5 m x 1.80 m | Row to Row spacing | 45 cm |
| Design | Split plot | | | | | | | | | | |
| Replications | 3 | | | | | | | | | | |
| Fertilizer | 90-85-60 NPK kg/ha | | | | | | | | | | |
| Plot size | 5 m x 1.80 m | | | | | | | | | | |
| Row to Row spacing | 45 cm | | | | | | | | | | |
| PREVIOUS YEAR'S RESULTS: | <p>Standard plant protection measures will be adopted. Recommended NPK will be applied uniformly to all the treatments. The data regarding yield & yield components will be recorded following standard procedures.</p> <p>New Experiment</p> | | | | | | | | | | |

D. HYBRID DEVELOPMENT PROGRAMME(*B. napus*)

| | |
|------------------|--------------------------------------------------------------------------------------------|
| 19. TITLE | MAINTENANCE OF INBRED LINES |
| OBJECTIVE | To maintain the available genetic stock for their utilization in synthesis of new hybrids. |
| RESEARCH WORKERS | Mariam Hassan Hafiz Saad Bin Mustafa Huma Qamar Tariq Mahmood |
| PROJECT DURATION | Continuous nature |
| LOCATION | Faisalabad |

TREATMENTS/
METHODOLOGY

A & B lines = 20
Restorer lines = 24

Layout Simple
Plot size 5 m x 0.90 m
Row spacing 45 cm
Fertilizer 90 : 85 : 60 NPK (kg/ha)
Sowing date First fortnight of October,
2018.

The inbred lines will be planted in isolation tunnels. “A” lines will be maintained by crossing with their respective “B” lines whereas “B” and “R” lines will be maintained through selfing.

PREVIOUS YEAR’S
RESULTS

Sufficient seed quantity of A, B & R lines was produced to evaluate and identify the best combinations among themselves.

20. TITLE

**DEVELOPMENT OF EXPERIMENTAL
HYBRIDS**

OBJECTIVE

To produce different hybrid combinations for evaluation of yield and other characters.

RESEARCH WORKERS

Dr. Sundas Shahzad
Mariam Hassan
Tariq Mahmood

PROJECT DURATION
LOCATION

Continuous nature
Faisalabad

TREATMENTS/
METHODOLOGY

“A” lines = 6 viz; 786-012, 786-013, 786-015,
786-016, 786-010, 786-003
“R” lines = 2 viz; 97010 and 96017

Row spacing 45 cm
Plant spacing 15 cm
Fertilizer 90 : 85 : 60 NPK kg/ha
Sowing date First fortnight of October, 2018.

A set of six “A” lines and one “R” line whereas another set with same “A” lines and different “R”

line will be planted in two isolation tunnels to avoid foreign pollen contamination. “A” lines will be hand pollinated with their respective “R” line. The developed 12 combinations (six in each tunnel) will be tested for their performance during next season.

PREVIOUS YEAR'S RESULTS

Seed of following twelve-canola hybrids was produced during Rabi 2017-18, to evaluate and identify the best combinations among themselves.

- | | |
|---------------------------------------------|----------------------------------------------|
| 1. 786-013 x 96024 R= FHC138 | 7. 786-013 x 96035 R= FHC-144 |
| 2. 786-012 x 96024 R= FHC-139 | 8. 786-012 x 96035 R= FHC-145 |
| 3. 786-015 x 96024 R= FHC-140 | 9. 786-015 x 96035 R= FHC-146 |
| 4. 786-016 x 96024 R= FHC-141 | 10. 786-016 x 96035 R= FHC-147 |
| 5. 786-017 x 96024 R= FHC-142 | 11. 786-017 x 96035 R= FHC-148 |
| 6. 786-003 x 96024 R= FHC-143 | 12. 786-003 x 96035 R= FHC-149 |

21. TITLE

TESTING OF NEW CANOLA HYBRIDS

OBJECTIVE

To test the performance of newly developed hybrids to select the best one.

RESEARCH WORKERS

Hafiz Saad Bin Mustafa
Mariam Hassan
Tariq Mahmood

PROJECT DURATION

Continuous

LOCATION

Faisalabad

**TREATMENTS/
METHODOLOGY**

Entries = 15 viz; HC-138, HC-139, HC-140, HC-141, HC-142, HC-143, HC-144, HC-145, HC-146, HC-147, HC-148, HC-149, FHC-126, FHC-133 and Hyola-401

| | |
|---------------|-----------------------------------|
| Design | R.C.B. |
| Repeats | 3 |
| Plot size | 5 m x 0.90 m |
| Row spacing | 45 cm |
| Plant spacing | 15 cm |
| Fertilizer | 90 :85 : 60 NPK kg/ha |
| Sowing date | First fortnight of October, 2018. |

Data on plant height, number of branches/plant, days to flowering, days to maturity, 1000 seed weight and seed yield will be recorded.

PREVIOUS YEAR'S
RESULTS

| Rank | HYBRID | SEED YIELD (kg/ha) |
|-------------|---------------|---------------------------|
| 1 | FHC-126 | 3500 |
| 2 | FHC-133 | 3441 |
| 3 | Hyola-401(C) | 3296 |
| 13 | FHC-136 | 2652 |
| | LSD 5 % | 175 |

22. TITLE SEED MULTIPLICATION OF APPROVED VARIETIES

OBJECTIVE

To produce the pre-basic seed of approved varieties for the maintenance of purity and quality seed production.

RESEARCH WORKERS

Hafiz Saad Bin Mustafa
Tariq Mahmood
Muhammad Aftab

PROJECT DURATION

Continuous nature

LOCATION

Faisalabad

**TREATMENTS/
METHODOLOGY**

The following four varieties will be sown to produce pre-basic seed. i.e. Punjab Canola, Faisal Canola, AARI Canola, Super Raya and Anmol Raya.

| <u>S.No.</u> | <u>Variety</u> | <u>Seed (kg)</u> |
|---------------------|-----------------------|-------------------------|
| 1. | Faisal Canola | 600 |
| 2. | AARI Canola | 400 |
| 3. | Super Raya | 400 |
| 4. | Anmol Raya | 200 |

BNS seed will be used for sowing of the above mentioned varieties and appropriate purity maintenance measures will be adopted for quality seed production.

| PREVIOUS YEAR'S RESULTS | <u>S.No.</u> | <u>Variety</u> | <u>Seed (kg)</u> |
|-------------------------|--------------|----------------|------------------|
| | 1. | Punjab Canola | 350 |
| | 2. | Faisal Canola | 550 |
| | 3. | AARI Canola | 200 |
| | 4. | Super Raya | 350 |
| | 5. | Anmol Raya | 450 |

23. TITLE DEMONSTRATION PLOT OF RAPESEED AND MUSTARD COMMERCIAL VARIETIES/HYBRIDS AT FARMER'S FIELDS

| | |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| OBJECTIVE | Evaluation and commercialization of Rapeseed and Mustard varieties |
| RESEARCH WORKERS | Hafiz Saad Bin Mustafa Tariq Mahmood Muhammad Aftab |
| PROJECT DURATION | Continuous |
| LOCATION | sites: 11 viz, ICI Pakistan Farm, Evoyl Group Farm, M.A. Farm, J.K. Farm, PARS, UAF, Ahmad Pur East, Muzaffargarh, Karor, Kot Addu and Gojra |
| TREATMENTS/METHODOLOGY | Faisal Canola, Punjab Canola, Rohi Sarson, Hyola-401, HC022B, Coral-432, 45S42, Super Raya, AARI Canola 1 Kanal plot each entry |

PREVIOUS YEAR'S RESULTS

Sowing Date:
02-11-2017

| Rank | Varieties/ Hybrids | Organization | Seed Yield kg/ha | Seed Yield Maunds/Acre |
|------|-----------------------|--------------------------------------------|---------------------|---------------------------|
| 1 | RBN-13018 | Oilseeds Research Institute, Faisalabad | 1706 | 17.27 |
| 2 | Hyola 401 | ICI, Pakistan.Ltd. | 1400 | 14.17 |
| 3 | SUN CROP-7 | Suncrop Group | 1398 | 14.15 |
| 4 | Faisal Canola | Oilseeds Research Institute, Faisalabad | 1396 | 14.13 |
| 13 | ARS-007 | Ali Akbar Group | 312 | 3.16 |
| 14 | SUN CROP-8 | Suncrop Group | 310 | 3.14 |

| | |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| 24. TITLE | NATIONAL TARAMERA YIELD TRIALS |
| OBJECTIVE | To evaluate the performance of different Taramera promising lines under Faisalabad conditions. |
| RESEARCH WORKERS | Mariam Hassan Hafiz Saad Bin Mustafa Tariq Mahmood |
| PROJECT DURATION | Continuous nature |
| LOCATION | Faisalabad |
| TREATMENTS/ METHODOLOGY | Received from PARC through Cooperative Programme. Lay out will be done according to instructions received with the material. |
| PREVIOUS YEAR'S RESULTS | National Uniform Taramera yield trial with 6 coded entries received from PARC, Islamabad were conducted during Rabi, 2017-18. |

**Seed yield kg/ha of Taramera entries in NUTYT from Ten locations during Rabi
2017-2018**

| Rank | Entry | ORI | RARI | Pioneer Sahiwal | BARS | AZRI Bhakar | Mean |
|-------------|----------------------|-------------|-------------|----------------------------|-------------|------------------------|-------------|
| 1 | 14CES003 | 630 | 793 | 1367 | 425 | 2163 | 1075 |
| 2 | 14CES007 | 648 | 952 | 1222 | 401 | 1111 | 866 |
| 3 | 26178 | 1056 | 863 | 1133 | 363 | 1230 | 929 |
| 4 | 14CES001 | 667 | 748 | 1217 | 422 | 987 | 808 |
| 5 | 27460 | 852 | 822 | 1439 | 243 | 815 | 834 |
| 6 | 14CES002 | 678 | 885 | 1333 | 408 | 1333 | 927 |
| | Location mean | 755 | 844 | 1285 | 377 | 1273 | |

F. Winter Rapeseed-Mustard, ORS, Khanpur

TREATMENTS/
METHODOLOGY Entries=50
Fatty acid profile through NIR

PREVIOUS YEARS
RESULTS Entries=54

| Entry Name | Oil % | Oleic Acid % | Linoleic Acid % | Linolenic Acid % | Erucic acid % |
|------------|-------|--------------|-----------------|------------------|---------------|
| Con II | 41.34 | 67.84 | 19.7 | 8.8 | 2.69 |
| RBN-17003 | 37.42 | 70.16 | 20.83 | 8.51 | 3.26 |
| RBN-17004 | 36.02 | 62.07 | 20.46 | 8.63 | 2.2 |
| RBN-17011 | 35.99 | 60.23 | 19.55 | 7.49 | 2.1 |

27. TITLE

HYBRIDIZATION FOR DEVELOPMENT OF HIGH OMEGA-3 STRAINS

OBJECTIVE Development of high omega-3 lines

RESEARCH WORKERS Hafiz Saad Bin Mustafa
Mariam Hassan
Tariq Mahmood
Muhammad Aftab

LOCATION Faisalabad

TREATMENTS/
METHODOLOGY **Following Genotypes (having high level of omega-3 and high yield) will be crossed for Gene Pyramiding**

1. Con-II x RBN-17003
2. Con-II x RBN-17004
3. Con-II x RBN-17011
4. RBN-17003 xRBN-17004
5. RBN-17003 x RBN-17011
6. RBN-17004 x RBN-17011

At flowering stage, emasculation work will be done on female parents and cover with cloth bag. On next day, pollen will be obtained from covered male parent and placed on respective emasculated flowers. Silique of the successful crosses will be harvested cross-wise and threshed to get F₀ seed. This F₀ seed will be preserved to grow F₁ generation during the next sowing season.

PREVIOUS YEAR'S
RESULTS First year experiment

| | | | | | | | | | | | | | | | | | | |
|------------------------|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-----|-----------------------|-----|-------|-----|---------|----------------|-----------|-------------|-------------|-------|------------|------------------------|-------------|-----------------------------------------------|
| 28. | TITLE | MAINTENANCE AND EVALUATION OF GERMPLASM | | | | | | | | | | | | | | | | |
| | OBJECTIVES | To maintain and evaluate germplasm for further utilization in breeding programme. | | | | | | | | | | | | | | | | |
| | RESEARCH WORKERS | Muhammad Aslam Nadeem Idrees Ahmad | | | | | | | | | | | | | | | | |
| | PROJECT DURATION | Continuous nature | | | | | | | | | | | | | | | | |
| | LOCATION | Oilseeds Research Station, Khanpur. | | | | | | | | | | | | | | | | |
| | TREATMENTS/ METHODOLOGY | <p>Entries = 252</p> <table border="0" style="width: 100%;"> <tr> <td style="padding-right: 40px;"><i>Brassica juncea</i></td> <td style="text-align: right;">140</td> </tr> <tr> <td><i>Brassica napus</i></td> <td style="text-align: right;">112</td> </tr> <tr> <td>Total</td> <td style="text-align: right;">252</td> </tr> <tr> <td>Repeats</td> <td style="text-align: right;">Non-replicated</td> </tr> <tr> <td>Plot size</td> <td style="text-align: right;">6 m x 0.9 m</td> </tr> <tr> <td>Row spacing</td> <td style="text-align: right;">45 cm</td> </tr> <tr> <td>Fertilizer</td> <td style="text-align: right;">90: 85:60 NPK kg/ha</td> </tr> <tr> <td>Sowing date</td> <td style="text-align: right;">1st fortnight of October 2018.</td> </tr> </table> <p>True to type plants will be selected for pure seed production to maintain the germplasm.</p> | <i>Brassica juncea</i> | 140 | <i>Brassica napus</i> | 112 | Total | 252 | Repeats | Non-replicated | Plot size | 6 m x 0.9 m | Row spacing | 45 cm | Fertilizer | 90: 85:60 NPK kg/ha | Sowing date | 1 st fortnight of October 2018. |
| <i>Brassica juncea</i> | 140 | | | | | | | | | | | | | | | | | |
| <i>Brassica napus</i> | 112 | | | | | | | | | | | | | | | | | |
| Total | 252 | | | | | | | | | | | | | | | | | |
| Repeats | Non-replicated | | | | | | | | | | | | | | | | | |
| Plot size | 6 m x 0.9 m | | | | | | | | | | | | | | | | | |
| Row spacing | 45 cm | | | | | | | | | | | | | | | | | |
| Fertilizer | 90: 85:60 NPK kg/ha | | | | | | | | | | | | | | | | | |
| Sowing date | 1 st fortnight of October 2018. | | | | | | | | | | | | | | | | | |
| | PREVIOUS YEAR'S RESULTS | 90 entries were maintained by employing the techniques of selfing / sib-mating for utilization in breeding programme. | | | | | | | | | | | | | | | | |

29. TITLE**GENETIC IMPROVEMENT IN BRASSICA THROUGH HYBRIDIZATION****OBJECTIVES**

To create & explore the genetic variability for the development of high yielding and canola version material.

RESEARCH WORKERS

Muhammad Aslam Nadeem
Idrees Ahmad

PROJECT DURATION

Continuous nature

LOCATION

ORS, Khanpur

Crosses will be attempted among parental lines selected on the basis of superior traits.

**TREATMENTS/
METHODOLOGY**

20 crosses will be made. Detail of Crosses to be attempted is as under.

Brassica juncea**High Yielder****High Yielder**

1. Super Raya
2. Super Raya
- 3.KJ-221
- 4.KJ-238
- 5.KJ-258

- | | |
|---|----------|
| X | KJ-258 |
| X | KJ-244 |
| X | HMU-321A |
| X | HMU-322B |
| X | MM-31-3 |

High Yielder**Low Erucic Acid**

- 6.KJ-221
- 7.KJ-238
- 8.KJ-258
- 9.Super Raya
- 10.KJ-244

- | | |
|---|-------------|
| X | AARI Canola |
| X | AARI Canola |
| X | AARI Canola |
| X | AARI Canola |
| X | AARI Canola |

Brassica napus**High Yielder****High Yielder**

11. KN-279
12. KN-279
13. KN-279
14. KN-279
15. KN-279

- | | |
|---|---------|
| X | MUM-1 |
| X | HC-021C |
| X | WS-520 |
| X | CHS-2 |
| X | RR-41-4 |

High Yielder

16.KN-279

17.KN-279

18.KN-279

19. KN-294

20. KN-294

Low erucic acid

X Faisal Canola

X Punjab Canola

X Rustam Canola

X Faisal Canola

X Punjab Canola

At flowering stage, emasculation will be done. Pollen will be collected from male parents and placed on respective emasculated flowers. Siliques of the successful Crosses will be harvested cross-wise and threshed to get F₀-seed. This F₀ seed will be preserved to grow F₁ generation during the next sowing season.

30. TITLE**STUDY OF FILIAL GENERATIONS****OBJECTIVES**

- A) Development of new genotypes along with high yield potential with superior quality traits having tolerance against insects, pests & diseases.
- B) Selection of suitable advance lines with desirable traits from F₆ to P.Y.Tfor evaluation.

RESEARCH WORKER

Muhammad Aslam Nadeem
Idrees Ahmad

PROJECT DURATION

Continuous nature

LOCATION

ORS, Khanpur

**TREATMENTS/
METHODOLOGY**

Following breeding material will be studied during current year.

| <u>Generation</u> | <u>No. of crosses</u> | <u>No. of progenies</u> |
|-------------------|-----------------------|-------------------------|
| F ₁ | 30 | -- |
| F ₂ | 18 | -- |
| F ₃ | 34 | 66 |
| F ₄ | 7 | 81 |
| F ₅ | 6 | 150 |

Repeats Non-replicated
 Row spacing 45 cm
 Fertilizer 90: 85 : 60 NPK (kg/ha)
 Sowing date 1st fortnight of October, 2018.

F₁ generation will be sown along with their parents. Selection on the basis of plant height, seed yield and size will be made in F₂ to F₆ generations. Plants with desired traits will be selected to advance their respective generations next year.

PREVIOUS YEAR'S RESULTS

Breeding material studied and selected are shown below: -

| <u>Generation</u> | <u>No. of crosses</u> | <u>No. of progenies</u> | <u>Plant selected</u> |
|-------------------|-----------------------|-------------------------|-----------------------|
| F ₁ | 18 | - | -- |
| F ₂ | 34 | - | -- |
| F ₃ | 7 | 130 | 130 |
| F ₄ | 6 | 75 | 75 |
| F ₅ | 6 | 143 | 143 |
| F ₆ | 7 | 244 | 12 |

31. TITLE

PRELIMINARY SEED YIELD TRIALS

OBJECTIVES

To compare the performance of new strains of *B. juncea* for better seed yield along with desirable traits.

PROJECT

DURATION

2018-19

TREATMENTS/ METHODOLOGY

***B. juncea*15+2=17 entries;**

KJ-280, KJ-281, KJ-282, KJ-283, KJ-284, KJ-285, KJ-286, KJ-287, KJ-288, KJ-289, KJ- 290, KJ-291, KJ-292, KJ-293, KJ-294, AARI Canola (check) and Super Raya (check)

***B.napus*13+2= 15 entries**

KN-326, KN-327, KN-328, KN-329, KN-330, KN-331, KN-332, KN-334, KN-335, KN-336, KN-337, KN-338, KN-339, Faisal Canola (check) and Rohi Sarson (check)

Layout

RCBD

PREVIOUS YEAR'S RESULTS

Plot Size 6 x 0.9 m
 Repeats 03
 Row spacing 45 cm
 Fertilizer 90:85:60 NPK kg/ha
 Sowing date Ist week of October, 2018
 Data on morphological traits i.e. 50% flowering, plant height, maturity and seed yield were recorded.

| <i>B.napus</i> | | | <i>B.junceae</i> | | |
|----------------|---------------|-------------|------------------|------------|-------------|
| Rank | Strain | Yield Kg/ha | Rank | Strain | Yield Kg/ha |
| 1 | KN-321 | 2500 | 1 | KJ-273 | 3241 |
| 2 | KN-318 | 2407 | 2 | KJ-269 | 2722 |
| 3 | KN-325 | 2370 | 3 | KJ-275 | 2722 |
| 4 | KN-319 | 2315 | 4 | KJ-268 | 2630 |
| 11 | FAISAL CANOLA | 2222 | 12 | Super Raya | 2259 |

32. **TITLE** **ADVANCED SEED YIELD TRIALS**
- OBJECTIVES** To compare the performance of advanced strains of *B. juncea* and *B. napus* for higher seed yield and other quality traits.
- RESEARCH WORKERS** Muhammad Aslam Nadeem
Idrees Ahmad
- PROJECT DURATION** 2018-19
- LOCATION** Oilseeds Research Station, Khanpur.
- TREATMENTS/ METHODOLOGY** **1- *B. juncea*15+2=17 entries;**
KJ-255, KJ-256, KJ-257, KJ-258, KJ-259, KJ-260, KJ-261, KJ-262, KJ-263, AARI Canola (check) and Super Raya (check).
- 2- *B. juncea*15+2=17 entries;**

KJ-265, KJ-266, KJ-267, KJ-268, KJ-269, KJ-270, KJ-271, KJ-272, KJ-273, KJ-274, KJ-275, KJ-276, KJ-277, KJ-278, KJ-279, AARI Canola (check) and Super Raya (check)

3- *B. juncea* 15+2=17 entries;

KJ-295, KJ-296, KJ-297, KJ-298, KJ-299, KJ-300, KJ-301, KJ-302, KJ-303, KJ-304, KJ-305, KJ-306, AARI Canola (check) and Super Raya (check)

1- *B.napus* 09+2= 11 entries

KN-317, KN-318, KN-319, KN-320, KN-321, KN-322, KN-323, KN-324, KN-325, Faisal Canola (check) and Rohi sarson (check)

Layout RCBD
 Plot Size 6 m x 1.35 m
 Repeats 3
 Row spacing 45 cm
 Fertilizer 90: 85:60 NPK (kg/ha.)
 Sowing date 1st fortnight of October, 2018.

Data on morphological traits i.e. plant height, flowering, maturity and seed yield will be recorded. Representative seed samples will be subjected to oil contents and oil quality traits analysis. Standard agronomic practices and plant protection measure will be adopted.

PREVIOUS YEAR, S RESULTS

| <i>B.napus</i> | | | <i>B.juncea</i> | | |
|----------------|----------------------|-------------|-----------------|-------------------|-------------|
| Rank | Strain | Yield Kg/ha | Rank | Strain | Yield Kg/ha |
| 1 | KN-310 | 3222 | 1 | KJ-258 | 2981 |
| 2 | FAISAL CANOLA | 2944 | 2 | KJ-255 | 2963 |
| 3 | KN-309 | 2907 | 3 | KJ-257 | 2556 |
| 4 | KN-314 | 2759 | 4 | Super Raya | 2519 |
| 5 | KN-316 | 2722 | 5 | KJ-256 | 2426 |

33. TITLE

DEMONSTRATION PLOTS AT FARMERS FIELD

OBJECTIVES

To study the advance strains of *B. juncea* and *B.napus* at farmer fields under climatic condition of Southern Punjab and Cholistan area.

RESEARCH WORKERS

Muhammad Aslam Nadeem
 Idrees Ahmad
 Dr. Zia Ullah Ghazali

Dr. Fida Hussain

PROJECT DURATION

2018-19

LOCATION

Southern Punjab and Cholistan Area.

TREATMENTS/
METHODOLOGY

B. juncea Set I= 1 + 1 = 02 entries;
Khanpur Raya and Super Raya

B. napus Set-II = 1 + 1 = 02 entries;
Faisal Canola and Rohi Sarson

Plot Size 6 m x 1.35 m
Repeats Non Replicated
Row spacing 45 cm
Fertilizer 90: 85:60 NPK (kg/ha.)
Sowing date 1st fortnight of October, 2018.

Data on morphological traits i.e. plant height, flowering, maturity and seed yield will be recorded. Standard agronomic practices and plant protection measure will be adopted.

34 (A). TITLE

MICRO SEED YIELD TRIAL OF RAPESEED (B. napus), 2018-19.

RESEARCH WORKERS

Muhammad Aslam Nadeem
Idrees Ahmad
Dr. Zia Ullah Ghazali
Dr. Fida Hussain

A. Methodology

1. No. of entries = 10 (A-J)
2. Design = R.C.B.
3. Repeats = 3
4. Plot size = 5 x 1.80m
5. Row spacing = 45 cm
6. Plant spacing = 15 cm (Thinning must be completed before first irrigation)
7. Fertilizer = 90: 85:60 NP kg/ha
8. Sowing Date = First Week of October, 2018
9. Irrigation = 3-4 (1st 30days after emergence, 2nd at flowering, 3rd at pod formation, 4th at seed formation if need).

B. Data to be recorded:

1. Days to flowering
2. Days to maturity
3. Number of plants/plot
4. Seed yield (kg/ha)

MICRO SEED YIELD TRIAL NINE ENTIERES OF B. NAPUS TRIAL CONDUCTED OVER 7 LOCATION IN PUNJAB, 2017-18

PREVIOUS YEAR, S
RESULTS

| Rank | Line/Varieties | AVG. |
|------|------------------|------|
| 1 | RBN-13017 | 2502 |
| 2 | RBN-13016 | 2275 |
| 3 | KN-279 | 2247 |
| 4 | KN-294 | 2229 |
| 5 | RBN-13022 | 2196 |
| 6 | FAISAL CANOLA | 2189 |
| 7 | RBN-13015 | 2004 |
| 8 | 15CBN-010 | 1971 |
| 9 | 15CBN-006 | 1649 |

34 (B). TITLE

MICRO SEED YIELD TRIAL OF MUSTARD (B. juncea)

A. Methodology

1. No. of Entries = 14(1-14)
 2. Design = R.C.B.
 3. Repeats = 3
 4. Plot size = 5 x 1.80m
 5. Row spacing = 45 cm
 6. Plant spacing = 15 cm (Thinning must be completed before first irrigation)
 7. Fertilizer = 90: 85:60 NP kg/ha
 8. Sowing Date = First Week of October, 2018
10. Irrigation = 3-4 (1st 30days after emergence, 2nd at flowering, 3rd at pod formation, 4th at seed formation if need).
9. Formation, 4th at seed formation if need).

B. Data to be recorded:

PREVIOUS YEAR, S
RESULTS

1. Days to flowering
2. Days to maturity
3. Number of plant/plot
4. Seed Yield (kg/ha)
5. Diseases

**MICRO SEED YIELD TRIAL THIRTEEN ENTIRES OF
B. JUNCEA TRIAL CONDUCTED OVER 7 LOCATION
IN PUNJAB, 2017-18.**

| Rank | Line/Varieties | AVG. |
|------|----------------|------|
| 1 | RBJ-15016 | 2392 |
| 2 | RBJ-15786 | 2305 |
| 3 | KJ-244 | 2190 |
| 4 | BRJ-1405 | 2190 |
| 5 | BRJ-1451 | 2179 |
| 6 | SUPER RAYA | 2142 |
| 7 | KJ-238 | 2093 |
| 8 | RBJ-14011 | 2063 |
| 9 | RBJ-14012 | 2000 |

35 (A). TITLE

**NATIONAL UNIFORM RAPESEED YIELD TRIAL
(NURYT)**

RESEARCH WORKERS

Muhammad Aslam Nadeem
Idrees Ahmad
Dr. Zia Ullah Ghazali
Dr. Fida Hussain

1. No. of Entries = 24
2. Design = R.C.B.
3. Repeats = 3
4. Plot size = 1.2 x 5m
5. Row spacing = 30 cm
6. Plant spacing = 15 cm (Thinning
must be
completed before first irrigation)
7. Fertilizer = 90: 60 NP kg/ha
8. Sowing Date = October, 2018

11. Irrigation = 3-4 (1st 30days after emergence, 2nd at flowering, 3rd at pod formation, 4th at seed formation if need).

C. Data to be recorded:

1. Days to flowering
2. Days to maturity
3. Plant height
4. Number of plants/plot
5. Seed Yield (kg/ha)
6. Seed weight
7. Oil contents
8. Insect, pest and Diseases

PREVIOUS YEAR'S RESULTS

SEED YIELD (Kg/ha) OF 15 MUSTARD ENTRIES AT 12 LOCATION IN PAKISTAN (NATIONAL UNIFORM MUSTARD YIELD TRIALS) 2017-18.

| Rank | Entry Code | Entry Name | Mean |
|------|------------|----------------|------|
| 1 | M-171650 | HMU-321 A | 2072 |
| 2 | M-171634 | KJ-238 | 2048 |
| 2 | M-171699 | HMU-322B | 2048 |
| 3 | M-171609 | MM-31-3 | 2002 |
| 4 | M-171669 | A5S35 | 1955 |
| 5 | M-171625 | Super Raya (C) | 1928 |
| 6 | M-171658 | MM-31-5 | 1911 |
| 7 | M-171660 | KJ-221 | 1909 |
| 8 | M-171666 | BRJ-1104 | 1885 |
| 9 | M-171611 | 13CBJ-004 | 1852 |
| 10 | M-171639 | BRJ-1304 | 1851 |
| 11 | M-171685 | MS-17 | 1793 |
| 12 | M-171644 | MS-15 | 1755 |
| 13 | M-171619 | GALAXY | 1740 |
| 14 | M-171680 | 13CBJ-006 | 1661 |

NATIONAL UNIFORM MUSTARD YIELD TRIAL (NUMYT)

35 (B). TITLE

(Seed and Sowing plan of Rape and Mustard trial still awaited)

RESEARCH WORKERS

Muhammad Aslam Nadeem

Idrees Ahmad

Dr. Zia Ullah Ghazali

Dr. Fida Hussain

1. No. of Entries = 24
2. Design = R.C.B.

3. Repeats = 3
4. Plot size = 1.2 x 5m
5. Row spacing = 30 cm
6. Plant spacing = 15 cm (Thinning must be completed before first irrigation)
7. Fertilizer = 90: 60 NP kg/ha
8. Sowing Date = October, 2018
9. Irrigation = 3-4 (1st 30days after emergence, 2nd at flowering, 3rd at pod formation, 4th at seed formation if need).

D. Data to be recorded:

9. Days to flowering
10. Days to maturity
11. Plant height
12. Number of plants/plot
13. Seed Yield (kg/ha)
14. Seed weight
15. Oil contents
16. Insect, pest and Diseases

SEED YIELD (KG/HA) OF 22 RAPESEED ENTRIES AT 12 LOCATION IN (NURYT) 2017-18.

| Rank | Entry Code | Entry Name | Mean |
|------|------------|----------------|------|
| 1 | R-171673 | KN-279 | 1985 |
| 2 | R-171644 | KN-294 | 1935 |
| 3 | R-171635 | MUN-1 | 1920 |
| 4 | R-171601 | HC-021C | 1896 |
| 5 | R-171628 | WS-520 | 1895 |
| 6 | R-171622 | CHS-2 | 1891 |
| 7 | R-171649 | RR-41-4 | 1887 |
| 8 | R-171666 | RBN-13028 | 1881 |
| 9 | R-171678 | 011-K-16-3 | 1872 |
| 10 | R-171605 | Kingola | 1829 |
| 11 | R-171650 | Hyola-401 (C) | 1794 |
| 12 | R-171639 | CHS-9 | 1740 |
| 13 | R-171615 | Chakwal Sarson | 1735 |
| 14 | R-171655 | MUN-2 | 1728 |
| 15 | R-171699 | HC-022B | 1705 |
| 16 | R-171681 | CHS-16 | 1685 |

PREVIOUS YEAR, S
RESULTS

| | | | |
|----|----------|---------------------|------|
| 17 | R-171669 | 14CBN-009 | 1684 |
| 18 | R-171687 | Faisal Canola(C) | 1676 |
| 19 | R-171689 | RBN-13029 | 1662 |
| 20 | R-171619 | MUN-3 | 1622 |
| 21 | R-171692 | 14CBN-001 | 1541 |
| 22 | R-171694 | MUN-4 | 1477 |

AGRONOMY SECTION

36. TITLE

DETERMINATION OF OPTIMUM SOWING TIME

OBJECTIVE

To assess optimum sowing time for maximum yield of candidate strains of Brassica.

RESEARCH WORKER

Dr. Fida Hussain

(S)

M. Aslam Nadeem

TREATMENTS:

Varieties = 2 viz

B. juncea = KJ-306

B. napus = KN-325

Date sowing = 6 viz

D₁: 20-09-2018

D₂: 30-09-2018

D₃: 01-10-2018

D₄: 10-10-2018

D₅: 20-10-2018

D₆: 30-10-2018

37. TITLE

PLANTING GEOMETRY

OBJECTIVE

To evaluate optimum planting density of different stature strains for better utilization of inputs and maximum yield of Brassica.

RESEARCH WORKER

Dr. Fida Hussain

(S)

M. Aslam Nadeem

PROJECT DURATION

Continuous nature

LOCATION

ORS, Khanpur

TREATMENTS

a. Varieties = 2

B. juncea = KJ-238

B. napus = KN-297

b. Line to line distance = 3

L₁ 30 cm

L₂ 45 cm

L₃ 60 cm

c. Plant to plant distance = 4

P₁ 10 cm

P₂ 15 cm

P₃ 22.5 cm

P₄ 30 cm

METHODOLOGY

Layout

Split Plot Design

Repeats

3

Plot size

6.0 x 1.80m

Fertilizer

75 : 75 NP kg/ha

Data on seed yield will be recorded. Standard plant protection measures will be adopted.

PREVIOUS

B. juncea

YEAR'S RESULTS

| <u>S.No.</u> | <u>Row spacing</u> | <u>10 cm plant spacing</u> | <u>15cm plant spacing</u> | <u>22.5cm 30cm</u> <u>pl.spc pl. spacing</u> | |
|---------------|--------------------|----------------------------|---------------------------|-------------------------------------------------|------|
| 1. | 30 cm | 2378 | 2955 | 2959 | 2918 |
| 2. | 45 cm | 2507 | 2992 | 3144 | 2493 |
| 3. | 60 cm | 1733 | 2007 | 2059 | 1896 |
| LSD 5% | | | | | |
| | | <u>Row spacing</u> | | 394 | |
| | | RS*Plt Spc. | | 419 | |

B. napus

| <u>S.No.</u> | <u>Row spacing</u> | <u>10 cm plant spacing</u> | <u>15cm plant spacing</u> | <u>22.5cm 30cm</u> <u>pl.spc pl. spacing</u> | |
|--------------|--------------------|----------------------------|---------------------------|-------------------------------------------------|------|
| 1. | 30 cm | 2011 | 2044 | 2022 | 2300 |
| 2. | 45 cm | 2429 | 2959 | 2567 | 2085 |
| 3. | 60 cm | 1744 | 2044 | 1852 | 1504 |
| LSD5% | | | | | |
| | | Row spacing | | 230 | |
| | | RS*PS | | 485 | |

38.TITLE**INTERCROPPING OF BRASSICA WITH SUGARCANE**

| | | |
|---------------------|----------------------------------------------------------------------------------------------------------------|-------------|
| OBJECTIVE | To asses net profit per acre of intercropped Sugarcane with Raya and Sugarcane alone. | |
| RESEARCH WORKER (S) | Dr. Fida Hussain M.Asalam Nadeem | |
| PROJECT DURATION | Continuous nature | |
| LOCATION | Khanpur | |
| TREATMENTS | Super Raya and Khanpur Raya will be intercropped with Sugarcane. | |
| METHODOLOGY | Layout | RCBD |
| | Plot size | 30 m x 30 m |
| | Data on seed yield of raya and sugarcane will be recorded. Standard plant protection measures will be adopted. | |

| | | | | | |
|-------------------------|-------------------------|--------------------------------|---------------------|-------------------------|----------------------------|
| PREVIOUS YEAR'S RESULTS | <u>B. juncea</u> | | | | |
| | <u>S.No.</u> | <u>Treatment</u> | <u>Raya</u> | <u>Sugarcane</u> | <u>Total income</u> |
| | | | <u>Kg/ha</u> | <u>Maund/ha</u> | <u>Rs/ha</u> |
| | 1. | Sugarcane + drill sown raya | 1721 | 1634 | 3,88,830 |
| | 2. | Sugarcane+broadcastraya | 1645 | 1567 | 3,72,480 |
| | 3. | Sugarcane alone | 0 | 1789 | 3,22,020 |

39. TITLE**RELAY CROPPING OF BRASSICA IN COTTON**

| | | |
|---------------------|-------------------------------------------------------------------------------------------------------|------|
| OBJECTIVE | To achieve maximum return from an area and bring brassica in cropping pattern of cotton growing areas | |
| RESEARCH WORKER (S) | Dr. Fida Hussain M. Aslam Nadeem | |
| PROJECT DURATION | Continuous nature | |
| LOCATION | Khanpur | |
| TREATMENTS | Super Raya and Khanpur Raya will be sown near maturity of cotton crop. | |
| METHODOLOGY | Layout | RCBD |

Plot size

30 m x 30 m

| PREVIOUS YEAR'S RESULTS | | | | | | | | | | |
|--------------------------------|--------------------------------------|-----|--------------------------------------------|----------------------------|-------------------------------|-----------------------------|--------------------------------|--------------------------|--------------------------------|---------------------------|
| S.No. | | | Extra income from seed cotton Rs/ha | Yield of raya Kg/ha | Income from raya Rs/ha | Yield of wheat Kg/ha | Income from wheat Rs/ha | Straw yield Kg/ha | Income from wheat Rs/ha | Total income Rs/ha |
| 1 | Relay cropping of Brassica in cotton | 183 | 14640 | 2245 | 123475 | 0 | 0 | 2245 | 8419 | 146534 |
| 2 | Wheat sown after cotton harvest | 0 | 0 | 0 | 0 | 3598 | 116935 | 3598 | 22488 | 139423 |

40. TITLE

USE OF WEEDICIDES IN BRASSICA

OBJECTIVE

To achieve maximum yield of brassica by controlling weeds with chemicals

RESEARCH WORKER (S)

Dr. Fida Hussain
M. Aslam Nadeem

PROJECT DURATION

Continuous nature

LOCATION

Khanpur

TREATMENTS

Weedicides = 3 viz;

- 1 Pendimethalene
- 2 S-metolachlore
- 3 Acetachlore

Varieties = 2 viz

- 1 Super Raya
2. Rohi Sarsoon

METHODOLOGY

Layout RCBD

Plot size 30 m x 30 m

Data on seed yield of raya and cotton, wheat and cotton will be recorded.

Standard plant protection measures will be adopted.

PREVIOUS YEAR'S RESULTS:

| <u>S.No.</u> | <u>Name of weedicide</u> | <u>Yield (kg/ha)</u> | |
|--------------|------------------------------|-------------------------|-----------------------|
| | | <u><i>B. juncea</i></u> | <u><i>B.napus</i></u> |
| 1 | Pendimethalene | 2511 | 2115 |
| 2 | Dual gold | 2496 | 2022 |
| 3 | Acetachlore | 2374 | 1985 |
| 4 | No weedicide | 2189 | 1848 |

41.TITLE

SEED PRODUCTION OF APPROVED VARIETIES.

OBJECTIVE

To produce the pre-basic seed of approved varieties for the maintenance of purity and quality seed production.

RESEARCH WORKER (S)

Fida Hussain
M. Aslam Nadeem

PROJECT DURATION

Continuous nature

LOCATION Khanpur

TREATMENTS The following variety will be sown to produce pre-basic seed.

| <u>S.No.</u> | <u>Variety</u> | <u>Seed (Kg)</u> |
|--------------|----------------|------------------|
| 1. | Khanpur Raya | 1000 |
| 2. | Super Raya | 2000 |
| 3. | Rohi Sarson | 500 |

PREVIOUS YEAR'S RESULTS:

| <u>S.No.</u> | <u>Variety</u> | <u>Seed (Kg)</u> |
|--------------|----------------|------------------|
| 1. | Khanpur Raya | 500 |
| 2. | Super Raya | 1600 |
| 3. | Rohi Sarson | 500 |

G. Plant Pathology, ORS, Khanpur

42. TITLE: SCREENING OF RAPESEEDS ADVANCE LINES/GENOTYPES AGAINST THE DISEASE CAUSED BY *ALTERNARIA BRASSICAE* UNDER ARTIFICIAL INOCULUM CONDITIONS.

OBJECTIVE: To find out resistance of Rapeseed genotypes/advance lines against the disease caused by *Alternaria brassica*.

RESEARCH Dr. Hafiz Muhammad Zia-Ullah, MuhammadAslam Nadeem

WORKER(S):

PROJECT DURATION: Continuous (2018-19)

LOCATION: ORS, Khanpur

TREATMENT(s): Rapeseed genotypes/advance lines supplied by
Rapeseed Botanist,
Khanpur.

METHODOLOGY:

Layout RCB
Repeats 3
Plot size 6 x 1.8 m
Row spacing 45 cm
Plant spacing 15 cm
Fertilizer 90: 85: 60 NPK (kg/ha)
Spreader After each two entries and around the trial.

Fungal culture of *Alternaria brassicae* will be received from Plant Pathology laboratory Oilseeds Research Institute Faisalabad. Foliar application of conidial suspension of *A. brassicae* will be done on crop stand as an artificial inoculation, to provide the maximum pressure of disease inoculum. Data of the disease will be recorded on the basis of 0-5 disease rating scale.

PREVIOUS YEAR'S RESULTS:

| Disease rating | AYT | PYT | Top 5 Resistant lines |
|------------------------|-----|-----|-----------------------------------|
| Resistant | 3 | 4 | KN-311, KN-322, KN-324, KN-325 |
| Moderately Resistant | 2 | 2 | |
| Moderately Susceptible | 4 | 2 | |
| Susceptible | 2 | 2 | |
| Total | 11 | 10 | |

43. TITLE: SCREENING OF MUSTARD ADVANCE LINES/GENOTYPES AGAINST THE DISEASE *ALTERNARIA BRASSICAE* UNDER ARTIFICIAL INOCULUM CONDITIONS.

OBJECTIVE (S): To find out resistance of Mustard genotypes/advance lines against the disease *Alternaria brassicae*.

RESEARCH WORKER(S): Dr .Hafiz Muhammad Zia-Ullah, Muhammad Aslam Nadeem

PROJECT DURATION: Continuous (2018-19)

LOCATION: ORS, Khanpur

TREATMENT(s): Mustard genotypes/advance lines supplied by Rapeseed Botanist, Khanpur.

METHODOLOGY:

Layout RCBD
 Repeats 3
 Plot size 6 x 1.8 m
 Row spacing 45 cm
 Plant spacing 15 cm
 Fertilizer 90 :85: 60 NPK (kg/ha)
 Sowing date 1st week of October, 2018.
 Spreader After each two entries and around the trial.

Fungal culture will be multiplied in the laboratory. Artificial inoculation will be done by foliar application of culture suspension of the fungus *Alternaria brassicae* in order to have maximum pressure of inoculum. Data will be recorded at the disease appearance following the disease rating scale.

PREVIOUS YEAR'S RESULTS:

| Disease rating | AYT | PYT | Top Resistant lines |
|------------------------|-----|-----|---------------------------------------------------------------------------------------------|
| Resistant | 8 | 9 | KJ-255, KJ-256, KJ-261, KJ-262, KJ-265, KJ-266, KJ-271, 272, 273, 274, 276, 277 and KJ-278. |
| Moderately Resistant | 2 | 5 | |
| Moderately Susceptible | - | 1 | |
| Susceptible | 2 | 1 | |
| Total | 12 | 16 | |

44. TITLE: SCREENING OF RAPESEED ADVANCE LINES FOR THEIR BEHAVIOUR AGAINST WHITE RUST (*Albugo candida*), POWDERY MILDEW (*Erysiphe cruciferarum*) AND DOWNY MILDEW (*Peronospora parasitica*).

OBJECTIVE(S): To find out resistance in advance lines of Rapeseed against White rust (*Albugo candida*), Powdery mildew (*Erysiphe cruciferarum* Opiz. ex. L. Junell) and Downy mildew (*Peronospora parasitica*).

RESEARCH WORKER(s): Dr .Hafiz Muhammad Zia-Ullah, Muhammad Aslam Nadeem

PROJECT DURATION: Continuous (2018-19)
LOCATION ORS, Khanpur

TREATMENT(s): Rapeseed genotypes/advance lines supplied by Rapeseed Botanist, Khanpur.

METHODOLOGY

Layout RCB
Repeats 3
Plot size 6 x 1.8 m
Row spacing 45 cm
Plant spacing 15 cm
Fertilizer 90 :85: 60 NPK (kg/ha)
Sowing date 1st week of October, 2018.

Rapeseed advance lines supplied by rapeseed Botanist will be screened against different diseases under natural conditions. Data of *White rust*, *downy and powdery mildew* will be recorded on the basis of 0-5 disease rating scale.

PREVIOUS YEAR'S RESULTS:

| Entries | Category & Rating | White Rust (<i>Albugo candida</i>) | Powdery Mildew (<i>Erysiphe cruciferarum</i>) | Downy Mildew (<i>Peronospora parasitica</i>) | Top Prominent lines |
|---------|-------------------|--------------------------------------|-------------------------------------------------|------------------------------------------------|------------------------------------------------|
| AYT | HR | 9 | 3 | 3 | KN-311, KN-312, KN-313, KN-314, KN-315, KN-316 |
| | R & MR | 3 | 7 | 5 | |
| | MS | 1 | 2 | 4 | |
| | HS | - | - | | |
| PYT | HR | 11 | 9 | 1 | KN-318, KN-320, KN-321, KN-322 |
| | R & MR | 3 | 6 | 12 | |

| | | | | | |
|--|----|---|---|---|--|
| | MS | 1 | - | 3 | |
| | HS | - | - | | |

45. TITLE: SCREENING OF MUSTARD ADVANCE LINES FOR THEIR BEHAVIOUR AGAINST WHITE RUST (*Albugo candida*), POWDERY MILDEW (*Erysiphecruciferarum*) AND DOWNY MILDEW (*Peronosporaparasitica*).

OBJECTIVE(S): To find out resistance of advanced lines of Mustard against White rust (*Albugo candida*), Powdery mildew (*Erysiphecruciferarum*) and Downy mildew (*Peronosporaparasitica*).

RESEARCH WORKER(s): Dr .Hafiz Muhammad Zia-Ullah, Muhammad Aslam Nadeem

PROJECT DURATION: Continuous (2018-19)

LOCATION: ORS, Khanpur

TREATMENT(s): Mustard genotypes/advance lines supplied by Rapeseed Botanist, Khanpur.

METHODOLOGY:

Layout RCBD
 Repeats 3
 Plot size 6 x 1.8 m
 Row spacing 45 cm
 Plant spacing 15 cm
 Fertilizer 90: 85: 60 NPK (kg/ha)
 Sowing date 1st week of October, 2018.

Mustard advance lines supplied by both stations will be screened against different diseases under natural conditions. Data of *White rust*, *downy and powdery mildew* will be recorded on the basis of disease rating scales.

PREVIOUS YEAR’S RESULTS:

| Entries | Category & Rating | White Rust (<i>Albugo candida</i>) | Powdery Mildew (<i>Erysiphecruciferarum</i>) | Downy Mildew (<i>Peronosporaparasitica</i>) | Top Prominent lines |
|---------|-------------------|-----------------------------------------|---------------------------------------------------|--------------------------------------------------|---------------------|
| | | | | | |

| | | | | | |
|------------|--------|----|---|----|----------------------------------------------------|
| AYT | HR | 9 | 3 | 3 | KJ- 256,259,260,261,262 |
| | R & MR | 3 | 7 | 5 | |
| | MS | 1 | 2 | 4 | |
| | HS | - | - | | |
| PYT | HR | 11 | 9 | 1 | KJ- 265,266,269,270,272, 273,274,275,277,278 |
| | R & MR | 3 | 6 | 12 | |
| | MS | 1 | - | 3 | |
| | HS | - | - | | |

46. TITLE: EVALUATION OF RAPESEED GERMPLASM (*Brassica napus*) FOR THEIR REACTION AGAINST *ALTERNARIA BRASSICAE* UNDER INOCULATED CONDITIONS.

OBJECTIVE(S): To maintain and evaluate germplasm of *Brassica napus* for further utilization in Breeding program.

RESEARCH WORKERS: Dr. Hafiz Muhammad Zia Ullah, Muhammad Aslam Nadeem

PROJECT DURATION: Continuous nature (2018-19).

LOCATION: ORS, Khanpur

TREATMENTS/

METHODOLOGY: Entries

B. napus = 112

Repeats Non –replicated

Plot size 6 m x 1.8 m

Row spacing 45 cm

Plant spacing 15 cm

Previous Year's
Results

| Disease | No. of Entries | Escape/Immune | Resistant | Susceptible |
|-------------------|----------------|---------------|-----------|-------------|
| Alternaria Blight | 80 | 0 | - | - |
| Alternaria Blight | 18 | - | 1-5% | - |
| Alternaria Blight | 14 | - | 5-12% | - |

47. TITLE: EVALUATION OF MUSTARD GERMPLASM (*Brassica juncea*) FOR THEIR BEHAVIOUR AGAINST *ALTERNARIA BRASSICAE* UNDER INOCULATED CONDITIONS.

OBJECTIVE(S): To maintain and evaluate germplasm of *Brassica napus* for further utilization in Breeding program.

RESEARCH WORKERS: Dr. Hafiz Muhammad Zia Ullah, Muhammad Aslam Nadeem

PROJECT DURATION: Continuous nature (2018-19).

LOCATION: ORS, Khanpur

TREATMENTS/

METHODOLOGY:

Entries
B. juncea =140
Repeats Non –replicated
Plot size 6 m x 1.8 m
Row spacing 45 cm
Plant spacing 15 cm

PREVIOUS YEAR'S

RESULTS:

| Disease | No. of Entries | Escape/Immune | Resistant | Susceptible |
|-------------------|----------------|---------------|-----------|-------------|
| Alternaria Blight | 96 | 0 | - | - |
| Alternaria Blight | 36 | - | 1-5% | - |
| Alternaria Blight | 8 | - | 5-12% | - |

48. TITLE: EVALUATION OF MUSTARD GERMPLASM (*Brassica juncea*) FOR THEIR REACTION AGAINST WHITE RUST, POWDERY AND DOWNY MILDEW UNDER NATURAL CONDITIONS.

OBJECTIVE(S): To evaluate germplasm for further utilization in Breeding program.

RESEARCH WORKERS: Dr. Hafiz Muhammad Zia Ullah, Muhammad Aslam Nadeem

PROJECT DURATION: Continuous nature (2018-19).

LOCATION: ORS, Khanpur

TREATMENTS/

METHODOLOGY:

Entries
B. juncea = 140
Repeats Non –replicated
Plot size 6 m x 1.8 m
Row spacing 45 cm
Plant spacing 15 cm

PREVIOUS YEAR'S

RESULTS

Disease reactions under natural condition

| Disease | No. of Entries | Escape/Immune | Resistant | Susceptible |
|----------------|----------------|---------------|-----------|-------------|
| Powdery Mildew | 137 | 0 | | - |

| | | | | |
|----------------|-----|---|-------|---|
| Powdery Mildew | 3 | | 1-2% | - |
| White rust | 131 | 0 | | - |
| White rust | 9 | | 1-3% | - |
| Downy mildew | 116 | 0 | | |
| Downy mildew | 24 | | 1-10% | |

49. TITLE: EVALUATION OF RAPESEED GERMPLASM (*Brassica napus*) FOR THEIR REACTION AGAINST WHITE RUST, POWDERY AND DOWNY MILDEW UNDER NATURAL CONDITIONS.

OBJECTIVE(S): To evaluate rapeseed germplasm for further utilization in Breeding program.

RESEARCH WORKERS: Dr. Hafiz Muhammad Zia Ullah, Muhammad Aslam Nadeem

PROJECT DURATION: Continuous nature (2018-19).

LOCATION: ORS, Khanpur

TREATMENTS/

METHODOLOGY: Entries
B. napus = 112

Repeats Non –replicated

Plot size 6 m x 1.8 m

Row spacing 45 cm

Plant spacing 15 cm

PREVIOUS YEAR'S RESULTS:

Disease reactions under natural condition

| Disease | No. of Entries | Escape/Immune | Resistant | Susceptible |
|----------------|----------------|---------------|-----------|-------------|
| Powdery Mildew | 110 | 0 | | - |
| Powdery Mildew | 2 | | 1-2% | - |
| White rust | 107 | 0 | | - |
| White rust | 5 | | 1-3% | - |

| | | | | | |
|--------------|-----|--|---|-------|--|
| Downy mildew | 105 | | 0 | | |
| Downy mildew | 7 | | | 1-10% | |

A. WINTER MUSTARD, BAHAWALPUR

50. TITLE **COLLECTION AND MAINTENANCE OF GERMPLASM OF (*B. Juncea*)**

OBJECTIVE To maintain and evaluate the germplasm of *Brassica juncea* for further studies

RESEARCH WORKER (S) Syed Arif Hussain Shah and Zeeshan Hafeez

PROJECT DURATION Continuous nature

LOCATION Bahawalpur,

TREATMENTS 200 entries

METHODOLOGY These entries have been selected and these lines will be sown in the field. The following data will be recorded.
Plant height, branches per plant, 1000 seed weight and seed yield per plant.

PREVIOUS YEAR'S RESULTS New experiment

51. TITLE **IMPROVEMENT IN BRASSICA JUNCEA THROUGH HYBRIDIZATION**

OBJECTIVE To create & explore the genetic variability for the development of high yielding and canola version material.

RESEARCH WORKER (S) Syed Arif Hussain Shah and Zeeshan Hafeez

PROJECT DURATION CONTINUOUS

LOCATION ORS, Bahawalpur

TREATMENTS 8 crosses will be attempted and of the crosses is as under

Brassica juncea

| | High Yields | | High Yields |
|----|------------------------|---|--------------------|
| 1. | Super raya | X | KJ-258 |
| 2. | Super raya | X | KJ-244 |
| 3. | Super raya | X | KJ-238 |
| 4. | Super raya | X | KJ-221 |
| | Low Erucic Acid | | High Yields |
| 5. | AARI Canola | X | KJ-258 |
| 6. | AARI Canola | X | KJ-244 |
| 7. | AARI Canola | X | KJ-238 |
| 8. | AARI Canola | X | KJ-221 |

METHODOLOGY

At flowering stage, emasculation will be done. Pollen will be collected from male parents and placed on respective emasculated flowers. Successful Crosses will be harvested cross-wise and threshed to get F₀-seed. This F₀ seed will be preserved to grow F₁ generation during the next sowing season.

PREVIOUS YEAR'S RESULTS

New experiment

52. TITLE
OBJECTIVE

STUDY OF FILIAL GENERATIONS (*B. juncea*)

To explore the genetic variability for the selection of recombinants with desirable traits and canola quality at Bahawalpur.

RESEARCH WORKER (S)

Syed Arif Hussain Shah and Zeeshan Hafeez

PROJECT DURATION

Continuous nature

LOCATION

Bahawalpur

TREATMENTS

F4 = 33 entries F5 = 24 entries F6 = 22 entries

METHODOLOGY

The breeding material will be studied in F3 to F5 generations.

| | |
|-------------|---------------------------|
| Repeats | Non-replicated |
| Plot size | 6 m (single row) |
| F3 | 33 plant to row progenies |
| F4 | 24 plant to row progenies |
| F5 | 22 plant to row progenies |
| Fertilizer | 80:60:60 NPK kg/ha |
| Sowing date | October |

The segregating material will be planted in an isolation to avoid any foreign pollen contamination. Selection on the basis of plant health and seed yield will be made in all generations. Erusic acid and glucosinolate levels of the selected plants will be determined to check the canola quality of the segregating generations. Plants with desired levels will be selected to advance their generations in next year.

PREVIOUS YEAR'S RESULTS

Filial Generation

- F2 33 single plant selections
- F3 24 single plant selections
- F4 22 single plant selections

53. TITLE **PRILIMINARY YIELD TRIALS OF *B. JUNCEA***
OBJECTIVE To compare the performance of new strains of *B. juncea* for better seed yield along with desirable traits.
RESEARCH WORKER (S) Syed Arif Hussain Shah and Zeeshan Hafeez
DURATION 2018-19
LOCATION Bahawalpur
TREATMENTS *B. juncea* 11+1=12 entries
VIZ: OBJ-1-OBJ-11 + Super raya(Check)
METHODOLOGY

| | |
|-------------|----------------------------|
| Design | RCBD |
| Repeats | 3 |
| Plot size | 5m x 1.8m |
| Row spacing | 45 cm |
| Fertilizers | 90: 85:60 NPK (kg/ha.) |
| Sowing date | First fortnight of October |

PREVIOUS YEAR'S RESULTS New experiment

54. TITLE **PRILIMINARY SEED YIELD TRIALS OF *B. NAPUS***
OBJECTIVE To compare the performance of new strains of *B. napus* for better seed yield along with desirable traits.
RESEARCH WORKER (S) Syed Arif Hussain Shah and Zeeshan Hafeez
DURATION 2018-19
LOCATION Bahawalpur
TREATMENTS *B. juncea* 11+1=12 entries
VIZ: OBN-1-OBN-11 + Super raya(Check)

METHODOLOGY The progeny of 250 selected plants will be sown for further evaluation and following data will be recorded.
 a) Plant height
 b) No of branches/plant
 c) Yield kg/ ha

PREVIOUS YEAR'S RESULTS The following characteristics were recorded and ranges are given below.

| CHARACTERS STUDIED | Range |
|---------------------------|--------------|
| Plant height | 95-145cm |
| 1000-grain weight | 50-55gm |
| Yield /plant | 110-150 gm |

57. TITLE PRELIMINARY YIELD TRIALS OF SAFFLOWER

OBJECTIVE To study the yield performance of safflower
RESEARCH WORKER (S) Syed Arif Hussain Shah and Zeeshan Hafeez

PROJECT Continuous nature

DURATION

LOCATION Bahawalpur

TREATMENTS 24 entries
 A1= 12 entries (thorny), A2= 12 entries (thorn less)
 including check.

METHODOLOGY These trials will be sown with randomized complete block design in three replications. The plot size will be maintained 6x1.8m with 45cm row spacing and 15cm plant spacing and following data will be recorded.

1.Days to flowering

2.Days to maturity

3.Plant Height(cm)

4.Disease reaction

5.Seed yield kg/ha

PREVIOUS YEAR'S RESULTS Five varieties including check.

| Ran | A1 trial (Thorny) | | A2 trial (Thorn less) | | |
|------------|--------------------------|----------------------|------------------------------|----------------|----------------------|
| | Variety | Yield (kg/ha) | Rank | Variety | Yield (kg/ha) |
| 1 | SAF-202 | 2158 | 1 | SAF -168 | 1630 |
| 2 | SAF -200 | 1852 | 2 | SAF -184 | 1630 |
| 3 | SAF -205 | 1850 | 3 | SAF -145 | 1540 |

| | | | | | |
|----|---------------------|------------|----|---------------------|------------|
| 4 | THORI-78 (Check) | 1630 | 4 | THORI-78 (Check) | 1537 |
| 12 | SAF -165 | 1230 | 12 | SAF-130 | 1210 |
| | LSD 5%= | 150 | | LSD 5%= | 155 |

58. TITLE

OBJECTIVE

RESEARCH

WORKER (S)

PROJECT

DURATION

LOCATION

TREATMENTS

METHODOLOGY

PREVIOUS YEAR'S RESULTS

ADVANCED YIELD TRIALS OF SAFFLOWER

To study the yield performance of safflower

Syed Arif Hussain Shah and Zeeshan Hafeez

Continuous nature

Bahawalpur

24 entries

C= 12 entries and C1= 12 entries including check.

These trials will be sown with randomized complete block design in three replications. The plot size will be maintained 6x1.8m with 45cm row spacing and 15cm plant spacing and following data will be recorded.

1. Days to flowering

2. Days to maturity

3. Plant Height

4. Disease reaction

5. Seed yield kg/ha

Five varieties including check.

| C trial | | | C1 trial | | |
|---------|---------------------|---------------|----------|---------------------|---------------|
| Rank | Variety | Yield (kg/ha) | Rank | Variety | Yield (kg/ha) |
| 1 | SAF-79 | 2160 | 1 | SAF -180 | 3700 |
| 2 | SAF -96 | 2160 | 2 | SAF -182 | 3080 |
| 3 | THORI-78 (Check) | 1850 | 3 | THORI-78 (Check) | 3080 |
| 4 | SAF-130 | 1537 | 4 | SAF-124 | 2460 |
| 12 | SAF -86 | 1030 | 12 | SAF-139 | 1210 |
| | LSD 5%= | 195 | | LSD 5%= | 240 |

59. TITLE

OBJECTIVE

RESEARCH WORKER

MICRO YIELD TRIALS OF SAFFLOWER

To study the yield performance of safflower at different locations of Punjab.

Syed Arif Hussain Shah and Zeeshan Hafeez

(S)
PROJECT DURATION Continuous/ 3rd Year
LOCATION (07) Bahawalpur, Khanpur, Bahawalnagar, Khanewal, Bhakar, Piplan and Chakwal
TREATMENTS 10 entries including check
METHODOLOGY These trials will be sown with randomized complete block design in three replications. The plot size will be maintained 6x1.8m with 45cm row spacing and 15cm plant spacing and following data will be recorded.
 1. Days to flowering
 2. Days to maturity
 3. Plant Height(cm)
 4. Disease reaction
 5. Seed yield kg/ha

PREVIOUS YEAR'S RESULTS **Yield kg/ha of M.Y.T of safflower for 2017-18**

| RANK | Variety | Bwp | Khanpur | khan | R.Y. | Khanewa | AKS | PCRW, Dim Garh | Average |
|-------------|------------------|------------|----------------|-------------|-------------|----------------|------------|-----------------------|----------------|
| 1 | SAF-65 | 1800 | 3100 | 1450 | 2440 | 1380 | 2034 | | |
| 2 | SAF-45 | 1733 | 2550 | 1510 | 3100 | 1200 | 2018 | | |
| 3 | SAF-50 | 1590 | 2890 | 1440 | 2770 | 1180 | 1974 | | |
| 4 | SAF-62 | 1733 | 3100 | 1500 | 2110 | 1170 | 1923 | | |
| 5 | SAF-55 | 1780 | 2550 | 1250 | 2660 | 1250 | 1898 | | |
| 6 | SAF-64 | 1480 | 3100 | 1130 | 2000 | 1050 | 1752 | | |
| 7 | THORI-78 (Check) | 1590 | 2550 | 1350 | 1660 | 1260 | 1682 | | |

60. TITLE

DEMOSTRATION BLOCK OF SAFFLOWER AT FARMERS FIELD

OBJECTIVE

To study the yield performance of safflower at farmers field to create awareness about safflower.

RESEARCH WORKER (S)

Syed Arif Hussain Shah and Zeeshan Hafeez

PROJECT DURATION

2018-19

LOCATION

At farmers field

TREATMENTS

Top 5 entries of Research trials including check
 Viz: SAF-45, SAF-65, SAF-180, SAF-182 and THORI-78 (Check)

METHODOLOGY

The demonstration block of 5 marla of each entry will be sown in non replicated fashion at farmer's field. The seed yield kg/plot will be recorded.

PREVIOUS YEAR'S RESULTS

New experiment

LINSEED (2018-19)

61. TITLE

MAINTENANCE AND EVALUATION OF LINSEED GENEPOOL

OBJECTIVE

To maintain and evaluate the genetic stock for utilization in breeding programme.

RESEARCH WORKERS

Dr. Rizwana Qamar
Mr. Fida Hussain
Dr. Sajida Habib

PROJECT DURATION

Continuous nature

LOCATION

Faisalabad

TREATMENTS/ METHODOLOGY

Entries = 179

Repeats Non-replicated

Plot size 5m x 0.6m

Fertilizer 80: 60:00 NPK kg/ha

Sowing date 1st week of November, 2018

Germplasm entries will be maintained by plant to progeny sowing, off type plants will be roughed out. Data of germination, plant height, days to flowering, days to maturity, flower colour, No. of tillers per plant, No. of capsules per plant, 1000-seed weight and seed yield will be recorded.

PREVIOUS YEAR'S RESULTS

179 entries of linseed were studied during Rabi, (2017-18). Seed of these entries was retained. Data for No. of capsules per plant, days to flowering and days to maturity, 1000 seed weight and seed yield (kg/ha) were recorded, which ranged from 45-134 capsules, 82-113 days and 151-178 days, 1.43-4.34 g and 5-16 kg/ha respectively.

62. TITLE

**HYBRIDIZATION PROGRAMME
LINSEED**

OBJECTIVE

To attempt fresh crosses for creating genetic variability and to be utilized in further breeding programmes.

RESEARCH WORKER (S)

Mr. Fida Hussain
Dr. Rizwana Qamar
Dr. Sajida Habib

PROJECT DURATION

2018-19

LOCATION

Faisalabad

**TREATMENTS /
METHODOLOGY**

High yielding lines viz. LS-17007, LS-17043, LS-17075, 15022, 15014 and Roshni

White and Bold seeded line; LS-2009

Short stature line; LS-29

Following crosses will be made

1. LS- 17007 × LS-29
2. LS- 17043 × LS-29
3. LS- 17075 × LS-29
4. LS- 2009 × LS-29
5. LS-17007 × LS-2009
6. LS-17043 × LS-2009
7. LS-17075 × LS-2009
8. LS-29 × LS-2009
9. LS-15014 × LS-15022
10. Roshni × LS-15022

| | |
|-------------|----------------------------------------|
| Repeats | Non-replicated |
| Plot size | 5 m x 0.30 m |
| Fertilizer | 80: 60:00 NPK kg/ha |
| Row spacing | 30 cm |
| Sowing date | 1 st week of November, 2018 |

**PREVIOUS YEAR'S
RESULTS**

Eight crosses were attempted during, 2017-18 and their seed was harvested for further studies.

63. TITLE**STUDY OF FILIAL GENERATIONS OF LINSEED****OBJECTIVE**

To study the genetic variability for selection of desirable plants/progenies.

RESEARCH WORKERS

Dr. Rizwana Qamar
Mr. Fida Hussain
Dr. Sajida Habib

PROJECT DURATION

Continuous nature

LOCATION

Faisalabad

**TREATMENTS/
METHODOLOGY**

Following breeding material will be studied in F₁ to F₇ generations.

| <u>Generation</u> | <u>Crosses</u> | <u>Progenies</u> |
|--------------------------|-----------------------|--------------------------------|
| F ₁ | 08 | Whole material will be studied |
| F ₂ | 08 | |
| F ₃ | 08 | 80 |
| F ₄ | 08 | 60 |
| F ₅ | 09 | 50 |
| F ₆ | 10 | 40 |
| F ₇ | 08 | 25 |

Plot size

| | |
|----------------------------------|----------------------------------------------|
| F ₁ | 5 m (single row) |
| F ₂ | According to availability of seed and space. |
| F ₃ to F ₆ | 5 m (single row) |
| F ₇ | 5 m x 0.60 m |
| Fertilizer | 80: 60:00 NPK kg/ha |
| Row spacing | 30 cm |
| Sowing date | 1 st week of Nov, 2018 |

**PREVIOUS YEAR'S
RESULTS**

Number of crosses studied and number of plants selected in F₁ to F₇ generations are

given below: -

| <u>Generation</u> | <u>Crosses studied</u> | <u>Progenies studied</u> | <u>No. of plants/Lines selected</u> |
|-------------------|------------------------|--------------------------------|-------------------------------------|
| F ₁ | 08 | Whole material will be studied | - |
| F ₂ | 08 | | 80 |
| F ₃ | 08 | 70 | 60 |
| F ₄ | 09 | 60 | 50 |
| F ₅ | 10 | 50 | 40 |
| F ₆ | 08 | 40 | 25 |
| F ₇ | 08 | 25 | 08 lines |

64. TITLE

LINSEED PRELIMINARY SEED YIELD TRIAL

OBJECTIVE

To study the comparative performance of newly developed strains.

RESEARCH WORKER (S)

Dr. Rizwana Qamar
Mr. Fida Hussain
Dr. Sajida Habib

PROJECT DURATION

Continuous

LOCATION

Faisalabad

**TREATMENTS/
METHODOLOGY**

Entries: 10 viz; LS-18002, LS-18021, LS-18033, LS-18040, LS-18059, LS-18078, LS-18084, LS-18091, LS-18097 and Roshni (check).

| | |
|-------------|----------------------------------------|
| Design | R.C.B.D. |
| Repeats | 3 |
| Plot size | 5 m x 0.90 m |
| Row spacing | 0.30m |
| Fertilizer | 80: 60:00 NPK kg/ha |
| Sowing date | 1 st week of November, 2018 |

Data on germination, plant height, branches per

plant, Capsules per plant, 1000-seed weight and seed yield per plot will be recorded.

PREVIOUS YEAR'S RESULTS

09 new strains were tested against check variety Chandni. Yield results are given below: -

| Rank | Line / Variety | Seed yield (kg/ha) |
|-------------|-----------------------|---------------------------|
| 1. | LS-17007 | 2088 |
| 2. | LS-17043 | 1850 |
| 3. | LS-17075 | 1638 |
| 4. | LS-17011 | 1543 |
| 6. | Chandni (C) | 1396 |
| 10. | LS-17020 | 1104 |
| | LSD 5% | 124 |

65. TITLE

LINSEED ADVANCED SEED YIELD TRIAL

OBJECTIVE

To evaluate the promising lines/strains for their seed yield and oil contents.

RESEARCH WORKER (S)

Mr. Fida Hussain
Dr. Rizwana Qamar
Dr. Sajida Habib

PROJECT DURATION

Continuous nature

**TREATMENTS/
METHODOLOGY**

Entries: 07 viz;
LS-17007, LS-17011, LS-17029, LS-17043, LS-17075, LS-17089 and Roshni (check).

| | |
|-------------|-----------------------------------|
| Design | RCBD |
| Repeats | 3 |
| Plot size | 5 m x 0.90 m |
| Row spacing | 30 cm |
| Fertilizer | 80: 60:00 NPK kg/ha |
| Sowing date | 1 st week of Nov, 2018 |

Data on germination, plant height, branches per plant, capsules per plant, 1000-seed weight and seed yield per plot will be recorded.

PREVIOUS YEAR'S RESULTS

06 promising strains were tested against standard variety Chandni. Results are given below: -

| S.No. | Line/Variety | Seed yield (kg/ha) |
|--------------|---------------------|---------------------------|
| 01. | LS-16006 | 1775 |

| | | |
|------------|--------------------|-------------|
| 02. | LS-16020 | 1500 |
| 03. | LS-16013 | 1495 |
| 04. | LS-16043 | 1484 |
| 07. | Chandni (C) | 1338 |
| | LSD 5% | 103 |

66. TITLE

LINSEED MICRO YIELD TRIAL

OBJECTIVE

To test the performance of promising strains under different agro ecological zones of the province.

RESEARCH WORKER (S)

Mr. Fida Hussain
Dr. Rizwana Qamar
Dr. Sajida Habib

**PROJECT DURATION
LOCATION**

Continuous
Six viz;
Faisalabad, Khanpur, Piplan, Bahawalpur,
Sahiwal and Mandi Baha-ud-Din.

**TREATMENTS/
METHODOLOGY**

Entries = 06 viz: LS-14074, LS-15014,
LS-15022, LS-16006, LS-16020 and Roshni
(check).

| | |
|-------------|-------------------------------------------|
| Design | R.C.B.D. |
| Repeats | 4 |
| Plot size | 5 m x 1.8 m |
| Row spacing | 30 cm |
| Fertilizer | 80:60:00 NPK kg/ha |
| Sowing date | 1 st week of November, 2018 |

Data on germination, plant height, branches per plant, capsules per plant, 1000-seed weight and seed yield per plot will be recorded.

**PREVIOUSYEAR'S
RESULTS**

Results are given below: -

| Sr. No | Line/ variety | Yield kg/ha | | | | Avg |
|-----------|--------------------|-------------|-------------|------------|-----------------------------|-------------|
| | | F.abad | Piplan | K. pur | B. pur | |
| 1 | LS-14074 | 1307 | 1380 | 1056 | Results are not reliable | 1247 |
| 2 | LS-15022 | 1444 | 1250 | 1074 | | 1256 |
| 3 | LS-15014 | 1546 | 1187 | 1037 | | 1256 |
| 4 | LS-15035 | 1353 | 856 | 963 | | 1057 |
| 5 | Chandni (C) | 1273 | 1183 | 833 | | 1096 |
| 6 | LS-13038 | 1347 | 746 | 981 | | 1024 |
| | LSD | 132 | 145 | 83 | | |

OILSEEDS ENTOMOLOGY (RABI, 2018-19)

67. TITLE **SCREENING OF ELITE LINES OF *Brassica juncea* AGAINST MUSTARD APHID**
- OBJECTIVE To find out relative response in different elite lines of *Brassica juncea* against mustard aphid
- RESEARCH WORKER (S) Mr. Sikandar Ali Cheema
Mr. Muhammad Zubair
- PROJECT DURATION 2018-2019
- LOCATION Faisalabad
- TREATMENTS/
METHODOLOGY 14 Entries will be evaluated
- Design R.C.B.
- Replications 3
- Plot size 5m x 1.80 m
- Fertilizer 90: 85:60 NPK kg/ha
- Date of sowing Mid November
- Data for aphid population will be recorded from top 10 cm of central shoots in five randomly selected plants from each treatment at weekly interval till the maturity of crop.

PREVIOUS YEAR'S RESULTS:

| Sr. No. | Strain/Variety | Avg. aphid population/10 cm central shoot |
|---------|----------------|-------------------------------------------|
| 1 | BRJ-238 | 14 |
| 2 | RBJ-14011 | 14 |
| 3 | RBJ-15016 | 15 |
| 4 | BRJ-1405 | 17 |
| 5 | KJ-15786 | 22 |
| 6 | BRJ-1451 | 28 |
| 7 | Super Raya | 30 |
| 8 | RBJ-14012 | 32 |
| 9 | KJ-244 | 37 |

68. TITLE **SCREENING OF ELITE LINES OF *Brassica napus* AGAINST MUSTARD APHID**
- OBJECTIVE To find out relative response in different elite lines of *Brassica napus* against mustard aphid.
- RESEARCH WORKER (S) Mr. Sikandar Ali Cheema
Mr. Muhammad Zubair

| Sr. No. | Strain/Variety | Avg. aphid population/10 cm central shoot |
|---------|----------------|-------------------------------------------|
| 1 | Faisal Canola | 20 |
| 2 | KN-294 | 24 |
| 3 | KN-279 | 26 |
| 4 | 15 CBN-010 | 28 |
| 5 | RBN-13016 | 29 |
| 6 | RBN-13022 | 29 |
| 7 | 15 CBN-006 | 29 |
| 8 | RBN-13017 | 33 |
| 9 | RBN-13015 | 42 |

PROJECT DURATION

2018-2019

LOCATIONS

Faisalabad

TREATMENTS/
METHODOLOGY

10 Entries will be evaluated

Design

R.C.B.

Replications

3

Plot size

5m x 1.80 m

Fertilizer

90:85:60 NPK kg/ha

Date of sowing

Mid November

Data for aphid population will be recorded from top 10 cm of central shoots on five randomly selected plants in each treatment at weekly interval till the maturity of crop.

PREVIOUS YEAR'S RESULTS:

69. TITLE

IDENTIFICATION OF GENETIC RESISTANCE IN BRASSICA AGAINST MUSTARD APHID

OBJECTIVE

To find out genetic resistance in *Brassica juncea* against mustard aphid.

RESEARCH WORKER (S)

Mr. Sikandar Ali Cheema

Mr. Muhammad Zubair

PROJECT DURATION

2018-2019

LOCATION

Faisalabad

TREATMENTS/

Entries selected in previous year.

METHODOLOGY

| | |
|----------------|--------------------|
| Row spacing | 45 cm |
| Fertilizer | 90:85:60 NPK kg/ha |
| Date of sowing | Mid November |

The source population will be sown in the field under natural conditions. The healthy plants free from aphid attack will be selected for further testing as single plant progenies during next season.

PREVIOUS YEAR'S RESULTS:

The Source population was sown in the field under natural conditions. **35** healthy plants free from aphid attack were selected for further testing as single plant progenies during next season.

70. TITLE

EVALUATION OF DIFFERENT SOAPS AGAINST MUSTARD APHID IN *Brassica juncea*

OBJECTIVE

To find out relatively cheaper and eco friendly source for the control of Mustard Aphid.

PROJECT DURATION

2018-19

LOCATION

Faisalabad

TREATMENTS/

Variety = Khanpur Raya

METHODOLOGY

Treatments = 4 Viz;

1. Safeguard (liquid) @ 2 ½ teaspoon in one gallon of water.
2. Dettol (liquid) @ 2 ½ teaspoon in one gallon of water.
3. Life buoy (liquid) @ 2 ½ teaspoon in one gallon of water.
4. Control (Unsprayed)

| | |
|-------------|--------------------|
| Design | R.C.B. |
| Repeats | 3 |
| Plot size | 5m x 0.9 m |
| Row spacing | 45 cm |
| Fertilizer | 90:85:60 NPK kg/ha |
| Sowing date | Mid November |

Data for Mustard Aphids will be recorded on the top 10 cm of the central shoot. When its population reaches at ETL, the treatments will be applied through single orifice hollow cone nozzle. Data regarding mortality of aphid will be recorded before application and 1 hour, 4 hours, 24 hours after application of soaps. The following formula will be used for data recording.

$$\% \text{ Mortality} = \frac{\text{Pre treatment population} - \text{post treatment population}}{\text{Pre treatment population}} \times 100$$

PREVIOUS YEAR'S RESULTS:

| | Duration of Data Recording | Population on Plants | | | | | Mortality %age |
|-----------|----------------------------|----------------------|-----|----|-----|----|----------------|
| | | 1 | 2 | 3 | 4 | 5 | |
| Safeguard | Before Treatment | 48 | 70 | 30 | 80 | 90 | 81.6% |
| | After 1 Hour | 42 | 67 | 25 | 54 | 76 | |
| | After 4 hour | 25 | 30 | 18 | 22 | 41 | |
| | After 24 hour | 09 | 14 | 06 | 13 | 15 | |
| Dettol | Before Treatment | 45 | 105 | 32 | 95 | 55 | 65% |
| | After 1 Hour | 23 | 78 | 29 | 78 | 33 | |
| | After 4 hour | 19 | 63 | 19 | 43 | 27 | |
| | After 24 hour | 14 | 40 | 12 | 32 | 19 | |
| Lifebuoy | Before Treatment | 38 | 20 | 52 | 120 | 65 | 69.14% |
| | After 1 Hour | 29 | 17 | 40 | 90 | 59 | |
| | After 4 hour | 17 | 10 | 27 | 55 | 37 | |
| | After 24 hour | 10 | 05 | 19 | 40 | 21 | |
| Control | Before Treatment | 35 | 20 | 18 | 22 | 70 | |
| | After 1 Hour | 35 | 20 | 22 | 22 | 70 | |
| | After 4 hour | 35 | 21 | 22 | 22 | 71 | |
| | After 24 hour | 34 | 22 | 30 | 21 | 76 | |

PREVIOUS YEAR RESULTS:Set (a) = *Brassica napus*During 2017-18, behavior of 9 lines/varieties screened against *Alternaria* blight disease

| Score | CONDITION | Reaction | Names of lines/varieties | No. of lines/varieties |
|-------|-----------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------------------------------------|------------------------|
| 0 | No disease | Immune | - | - |
| 1 | A few scattered plants blighted with 1-2 spots/plant. | Very Highly Resistant (VHR) | - | - |
| 2 | A few scattered plants blighted with 5-10 spots/plant. | Highly Resistant (HR) | RBN-13015, | 01 |
| 3 | A few scattered plants blighted with 11-25 spots/plant. | Resistant (R) | KN-279, KN-294, RBN-13022, RBN-13016, RBN-13017 | 05 |
| 4 | A few scattered plants blighted with 26-50 spots/plant. | Moderately Resistant (MR) | 15CBN-006, 15CBN-010, Faisal canola, (check) | 03 |
| 5 | Blighted plant more common, nearly every leaf, stem and branch infected but plant remains normal in form. | Moderately Susceptible (MS) | - | - |
| 6 | Every plant infected with about 50% of leaf area and stem. | Susceptible (S) | - | - |
| 7 | Every plant severely infected with about 75% of leaf area and stem. | Highly Susceptible (HS) | KJ-159 (Spreader) | 01 |
| 8 | Every severely | Very Highly | - | - |

| | | | | |
|---|------------------------------------------------------------------------|-----------------------------|---|---|
| | infected defoliation common and 95% of stem surface affected | Susceptible (VHS) | | |
| 9 | Defoliation severe and 100% leaf and stem area affected and destroyed. | Completely Susceptible (CS) | - | - |

Set (a) = *Brassica juncea*

During 2015-16, behavior of 13 lines/varieties screened against *Alternaria* blight disease

| Score | Conditions | Reaction | Name of lines/varieties | No. of lines/varieties |
|-------|-----------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------------------------------------------------------|------------------------|
| 0 | No disease | Immune | - | - |
| 1 | A few scattered plants blighted with 1-2 spots/plant. | Very Highly Resistant (VHR) | - | - |
| 2 | A few scattered plants blighted with 5-10 spots/plant. | Highly Resistant (HR) | - | - |
| 3 | A few scattered plants blighted with 11-25 spots/plant. | Resistant (R) | - | - |
| 4 | A few scattered plants blighted with 26-50 spots/plant. | Moderately Resistant (MR) | KJ-15786, RBJ-15016, | 02 |
| 5 | Blighted plant more common, nearly every leaf, stem and branch infected but plant remains normal in form. | Moderately Susceptible (MS) | RBJ-14011, RBJ-14012, BRJ-14015 BRJ-238, KJ-244, BRJ-1451, Super raya (check) | 07 |
| 6 | Every plant | Susceptible (S) | - | 0 |

| | | | | |
|---|-----------------------------------------------------------------------------|-------------------------------|-------------------|----|
| | infected with about 50% of leaf area and stem. | | | |
| 7 | Every plant severely infected with about 75% of leaf area and stem. | Highly Susceptible (HS) | KJ-159 (Spreader) | 01 |
| 8 | Every severely infected defoliation common and 95% of stem surface affected | Very Highly Susceptible (VHS) | - | - |
| 9 | Defoliation severe and 100% leaf and stem area affected and destroyed. | Completely Susceptible (CS) | - | - |

REFERENCE:

Mayo, L. D and Datar, V. V., 1986. Phytopath matry. Technical bullatin-2. Special bullatin-3, Puld. Marathwada Agri. University, Porbhari- 431402, 196-97.

72. TITLE

EVALUATION OF VARIOUS FUNGICIDES AGAINST ALTERNARIA BLIGHT (*Alternaria brassicae*) DISEASE OF BRASSICA

OBJECTIVE

To find out the most effective fungicide against *Alternaria blight (Alternaria brassicae)* disease

RESEARCH WORKERS

Ahsan Mohyo-ud-Din
Qamar Anser Tufail Khan

PORTJECT DURATION

2015-2018

LOCATION

Faisalabad

TREATMENTS/ METHODOLOGY

Brassica juncea line KJ-159, susceptible to *Alternaria blight*
T₁ = Mancozeb 80 WP @ 2.5 g/liter of water
T₂ = Topsin – M (Thiophenate Methyl) @ 2.5 g/liter of water
T₃ = Carbendazim 50wp @ 2gm/liter of water
T₄ = Score 250 EC (Difenoconazole) @ 1ml/liter of water
T₅ = Nativo 75 WG (Tebuconazole + Trifloxystrobin) @

1g/liter of water
T₆ = Control

| | |
|---------------|--------------------------------------|
| Design | RCB |
| Plot size | 6m × 1.8m |
| Repeats | 3 |
| Row Spacing | 45cm |
| Plant Spacing | 15cm |
| Fertilizer | 75 : 75: 60Kg NPK/ ha |
| Sowing Date | 1 st fortnight of October |
| 2018 | |

- Efforts will be made to introduce disease by spraying the pathogen.
- Fungicides will be sprayed when environment become favourable for disease/first appearance of disease sign at the interval of every 10 days.
- Efficacy of above mentioned fungicides will also be tested through poisoned food technique *in-vitro*.

| PREVIOUS YEAR'S RESULTS <i>In-vivo</i> trial | Treatments | Disease %age | %disease increase or decrease/control |
|--------------------------------------------------------|-------------------------------------------------------------------------|-----------------------------|-----------------------------------------------|
| | Nativo 75 WG (Tebuconazole + Trifloxystrobin) @ 1g/liter of water | 6 | 94 |
| | Score 250 EC (Difenoconazole) @ 1ml/liter of water | 20 | 80 |
| | Mancozeb 80 WP @ 2.5g/ liter of water | 24 | 76 |
| | Topsin – M (Thiophenate Methyl) @ 2.5 g/liter of water | 30 | 70 |
| | Amistar Top 325 SC (Azoxystrobin + Difenoconazole) @ 1ml/liter of water | 45 | 55 |
| | Carbendazem 50 WP @ 2 g/ liter of water | 56 | 44 |
| | Control | 100 | 0 |
| <i>In-vitro</i> | | | |
| | Treatment | Mycelial growth (mm) | % disease increase or decrease/control |
| | Nativo 75 WG (Tebuconazole + Trifloxystrobin) @ 1g/liter of water | 4 | 96 |

| | | | |
|--|----------------------------------------------------------------------------|----|----|
| | Score 250 EC (Difenoconazole) @ 1ml/ liter of water | 14 | 84 |
| | Mancozeb 80 WP @ 2.5g/ liter of water | 20 | 78 |
| | Topsin – M (Thiophenate Methyl) @2.5g/liter of water | 24 | 73 |
| | Amistar Top 325 SC (Azoxystrobin + Difenoconazole) @ 1ml/liter of water | 40 | 56 |
| | Carbendazem 50 WP@ 2g/ liter of water | 45 | 50 |
| | Control | 90 | 0 |

73. TITLE **EVALUATION OF VARIOUS FUNGICIDES AGAINST STEM ROT (*Sclerotinia sclerotorum*) DISEASE OF BRASSICA**

OBJECTIVE To find out the most effective fungicide against Stem rot (*Sclertinia sclerotorum*) disease

RESEARCH WORKERS Qamar Anser Tufail Khan
Ahsan Mohyo-ud-Din

PORJECT DURATION Continuous nature

LOCATION Faisalabad

TREATMENTS/ METHODOLOGY *Brassica juncea* line KJ-159, susceptible to stem rot disease
 T₁ = Topsin – M (Thiophenate Methyl) @ 2.5 g/liter of water
 T₂ = Nativo 75 WG (Tebuconazole + Trifloxystrobin) @ 1g/liter of water
 T₃ = Score 250 EC (Difenoconazole) @ 1ml/liter of water
 T₄ = Mancozeb 80 WP @ 2.5 g/liter of water
 T₅ = Carbendazim 50wp @ 2gm/liter of water
 T₆ = Control

| | |
|---------------|-------------------------------------------|
| Design | RCB |
| Plot size | 6m × 1.8m |
| Repeats | 3 |
| Row Spacing | 45cm |
| Plant Spacing | 15cm |
| Fertilizer | 75 : 75: 60Kg NPK/ ha |
| Sowing Date | 1 st fortnight of October 2018 |

Efforts will be made to introduce disease by spraying the pathogen. Fungicides will be sprayed when environment become favorable for disease/first appearance of disease sign at the interval of every 10 days.

Efficacy of above mentioned fungicides will also be tested through poisoned food techniques *in-vitro*.

PREVIOUS YEAR'S RESULTS
In vitro

| Treatments | Mycelial growth (mm) | %disease increase or decrease/control |
|-------------------------------------------------------------------|-----------------------------|----------------------------------------------|
| Topsin – M (Thiophenate Methyl) @ 2.5 g/liter of water | 09 | 90 |
| Carbendazim 50wp @ 2gm/liter of water | 16 | 82 |
| Nativo 75 WG (Tebuconazole + Trifloxystrobin) @ 1g/liter of water | 20 | 78 |

| | | |
|--------------------------------------------------------------------------|----|----|
| Score 250 EC (Difenoconazole) @ 1ml/liter of water | 25 | 72 |
| Amistar Top 325 SC (Azoxystrobin + Difenoconazole) @ 1ml/ liter of water | 28 | 69 |
| Mancozeb 80 WP @ 2.5g/ liter of water | 54 | 40 |
| Control | 90 | 0 |

74. TITLE **SCREENING OF *BRASSICA* CULTIVARS/LINES AGAINST WHITE RUST AND DOWNY MILDEW DISEASES**

OBJECTIVE To work out the relative resistance of *Brassica* material against white rust (*Albugo candida*) and downy mildew (*Peronospora parasitica*) diseases

RESEARCH WORKERS Qamar Anser Tufail Khan
Ahsan Mohyo-ud-Din

PROJECT DURATION Continuous nature

LOCATION Faisalabad

TREATMENTS/ METHODOLOGY Brassica material
Set (a) = *Brassica napus* (10) lines
Set (b) = *Brassica juncea* (14)lines

| | |
|---------------|-------------------------------------------|
| Design | RCB |
| Plot size | 6m × 1.8m |
| Repeats | 3 |
| Row Spacing | 45cm |
| Plant Spacing | 15cm |
| Fertilizer | 75 : 75: 60Kg NPK/ ha |
| Sowing Date | 1 st fortnight of October 2018 |

Brassica lines will be screened against White rust and Downy mildew diseases under natural condition. Line KJ-159 will be used as disease spreader. Disease intensity will be recorded according to disease rating scale.

PREVIOUS YEAR'S RESULTS White rust and Downy mildew diseases did not appear during 2017-2018.

OIL TECHNOLOGY

75. TITLE CONTENT OF

OBJECTIVE
Lines

RESEARCH WORKER

PROJECT DURATION

LOCATION

TREATMENTS/
evaluated.
METHDOLOGY

PREVIOUS YEAR'S
tested
RESULTS

DETERMINATION OF OIL

PROMISING LINES OF SUMMER MUSTARD

Identification of Zaid kharif *Brassica*
having high oil content

Shazia Saeed
Ahmad Nawaz Gill

Continuous nature

Faisalabad

114 samples of *Brassica* will be

Oil contents will be determined through
Soxhlet
apparatus

41 lines of Zaid kharif *Brassica* were
tested
for oil contents. In this regard 123 seed
samples were analyzed

The Oil contents of Zaid kharif *Brassica* lines

| Crop | No. of lines | Oil contents range (%) | No. of Lines with Oil contents 40 % or more |
|-----------------------------|--------------|------------------------|---------------------------------------------|
| Zaid kharif <i>Brassica</i> | 41 | 34-42 | 12 |

76. TITLE CONTENT OF

DETERMINATION OF OIL

PROMISING LINES/VARIETIES OF RAPESEED AND MUSTARD (RABI GROUP)

| | |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OBJECTIVE Lines | Identification of Rapeseed and Mustard having high oil content |
| RESEARCH WORKER | Ahmad Nawaz Gill Shazia Saeed |
| PROJECT DURATION | Continuous nature |
| LOCATION | Faisalabad |
| TREATMENTS/ evaluated. | 381 samples of <i>Brassica</i> will be |
| METHODOLOGY | Oil contents will be determined through Soxhlet apparatus |
| PREVIOUS YEAR'S of RESULTS | 25 lines of <i>Brassica napus</i> and 52 lines <i>Brassica juncea</i> were tested for oil contents. In this regard 231 seed samples were analyzed |

The Oil contents of Rapeseed and Mustard lines

| Crop | No. of lines | Oil contents range (%) | No. of Lines with Oil contents 40 % or more |
|------------------------|---------------------|-------------------------------|----------------------------------------------------|
| <i>Brassica napus</i> | 25 | 35-41 | 5 |
| <i>Brassica juncea</i> | 52 | 30-42 | 14 |

77. TITLE

**DETERMINATION OF FATTY
ACID PROFILE OF PROMISING
LINES OF BRASSICANAPUS**

| | |
|-----------------|------------------------------------------------------------------|
| OBJECTIVE | Identification of Brassica lines having canola quality traits |
| RESEARCH WORKER | Ahmad Nawaz Gill Shazia Saeed |

| | |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------|
| PROJECT DURATION | Continuous nature |
| LOCATION | Faisalabad |
| TREATMENTS/ METHDOLOGY | 174 samples of <i>Brassica napus</i> will be evaluated. Fatty acid profile will be determined through NIR. |
| PREVIOUS YEAR'S RESULTS | 57 lines of <i>Brassica napus</i> lines were tested for fatty acid profile. In this regard 201 seed samples were analyzed. |

Fatty acid profile of Brassica lines

| Crop | No. of lines tested | Oleic acid % (omega 9) | linoleic acid % (omega 6) | linolenic acid % (omega 3) | Erucic acid % |
|-----------------------|---------------------|-------------------------------------------|-------------------------------------------|------------------------------------------|------------------------------------------|
| <i>Brassica napus</i> | 57 | 32-70 | 12-23 | 5-12 | 0.05-4.00 |
| Promising lines | | (No. of Lines having more than 40%) 52 | (No. of Lines having more than 15%) 45 | (No. of Lines having more than 8%) 13 | (No. of Lines having less than 2%) 32 |

78. TITLE CONTENT OF

DETERMINATION OF OIL

PROMISING LINES OF LINSEED

| | |
|------------------|---------------------------------------------------------|
| OBJECTIVE | Identification of Linseed Lines having high oil content |
| RESEARCH WORKER | Shazia Saeed Ahmad Nawaz Gill |
| PROJECT DURATION | Continuous nature |
| LOCATION | Faisalabad |

TREATMENTS/
METHDOLOGY

75 samples of Linseed will be evaluated.
Oil contents will be determined through
Soxhlet
apparatus

PREVIOUS YEAR'S
content
RESULTS

23 lines of Linseed were tested for oil
percentage. In this regard 69 samples
analyzed

were

The Oil contents of Linseed lines

| Crop | No. of lines | Oil contents range (%) | No. of Lines with Oil contents 35 % or more |
|-------------|---------------------|-------------------------------|----------------------------------------------------|
| Linseed | 23 | 29-39 | 8 |