

ABRIDGED REPORT 2018-19
OILSEEDS RESEARCH INSTITUTE, FAISALABAD

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OVERVIEW

Oilseeds Research Institute, Faisalabad is developing varieties of major oilseed crops i.e. Canola, Sunflower, Linseed, Castor bean, Sesame and Soybean . In year 2018 this institute has developed one variety of Brassica (Super Canola), one of Linseed (Roshni) and one of Sesame (Til-18). For the promotion of oilseeds crops in Punjab, a collaborative campaign was executed by this institute with Agri. Extension wing and stakeholders. Under this campaign mega seminars on canola and sunflower were organized in different cities of Province to motivate farmers about the benefits of oilseed crops. Training manuals for canola and sunflower crops were prepared and provided to Agri. Extension. Trainings for master trainers of Agri. Extension were also organized. Subsidy was also provided to the farmers on the cultivation of Sunflower crop @ Rs. 5000/acre by the Govt. of Punjab which was also the part of this campaign.

This institute also provided many services like; sale of pre-basic seed of different oilseed crops, advisory services to farmers through audio/video, print and social media, technology transfer to the farmers by arranging farmer's days, seminars, supervision and guidance of M.Sc. (Hons.) and Ph.D students, along with technical training to interneers of various Agriculture Universities and training/guidance to the staff of other sister organizations.

RESEARCH WORK

A. RAPESEED/MUSTARD

a. Zaid Kharif Brassica

- i.** In preliminary yield trial, out of 15 strains tested, ZBJ-18008 out yielded with production of 4370 kg/ha seed yield than AARI Canola (4111 kg/ha).
- ii.** In advanced yield trial, 13 entries were tested in Zaid Kharif season. ZBJ-16008 gave the best seed yield
- i.e.** 3975 kg/ha compared with the standard variety AARI Canola (3195kg/ha).
- iii.** In Micro Yield Trial, 10 strains were tested. ZBJ-11002 ranked first by producing average seed yield of 1908 kg/ha at 4 different locations of Punjab along with standard variety AARI Canola having seed yield 1710

kg/ha. While at ORI, FSD ZBJ-11002 ranked first with seed yield of 3519 kg/ha compared with standard variety AARI Canola (2970 kg/ha).

b. Rabi Brassica

Brassica napus L.

- i.** In the preliminary yield trials, 14 entries were tested. The line RBN-18021 stood first with seed yield of 4556 kg/ha compared with 3852 kg/ha seed yield from Super Canola, the standard variety.
- ii.** In advanced yield trial, 10 entries were tested in Rabi season. The advance line RBN-14017 out yielded with the seed yield of 3175 kg/ha compared with 3052 kg/ha seed yield from Super Canola, the standard varieties.
- iii.** In micro yield trials, out of 10 entries tested, RBN-13022 ranked first by producing average seed yield of 1966 kg/ha from 7 locations whereas, Super Canola, the standard variety, produced the seed yield of 1791 kg/ha.
- iv.** In Hybrid development programme of Canola, 15 local hybrids were evaluated during 2018-19. The hybrid FHC-143 remained at the top by producing average seed yield of 4741 kg/ha, whereas Hyola-401, the commercial hybrid produced average seed yield of 2889 kg/ha.

Brassica Juncea L.

- i.** In the preliminary yield trial out of 11 strains tested, RBJ-18008 produced the seed yield of 3689 kg/ha. Whereas Super Raya produced seed yield of 3622 kg/ha as a standard variety.
- ii.** In advanced yield trial, 14 entries were tested. RBJ-17005 produced the seed yield of 3146 kg/ha whereas standard varieties; Super Raya produced seed yield of 2677 kg/ha.

- iii.** In micro yield trials, out of 14 entries tested at 6 locations, RBJ-15019 ranked 1st by producing average seed yield of 2044 kg/ha, whereas Super Raya, produced the seed yield of 2030 kg/ha.

B. SUNFLOWER

- i.** Twenty four sunflower hybrids were evaluated against Hysun-33 (Check) in station yield trials during spring 2019. FH-773 ranked first with seed yield 3071 kg/ha when compared with check, Hysun-33 (1981 kg/ha).
- ii.** Seed of seven promising hybrids were multiplied during 2018-19 for further evaluation in Micro Yield Trial and National Uniform Yield Trial.
- iii.** Twenty new hybrid combinations were developed during 2018-19 by pollinating different “A” lines with selected “R” lines for testing in station yield trials.
- iv.** In Micro Yield Trial, 11 sunflower hybrids were tested at six locations across the province including one check (Hysun-33). Four hybrids excelled more yield against check. The Hybrid FH- 741 ranked first (3080 kg/ha) among them.



Fig 1. Promising Sunflower hybrid (FH-516) showing good head size and compact filling at reproductive stage.

C. SESAME

- i. In Preliminary yield trial, promising line 17005 and 18003 gave the highest yield 1504 & 1418 kg/ha respectively while the line 16002 gave the minimum yield 736 kg/ha.
- ii.
- iii. In advance yield trial strain 17006 and 17003 gave the maximum yield 891 kg/ha and 809 kg/ha, where as the minimum yield 607 kg/ha was observed in 17001.
- iv. In Micro Seed Yield trial strain 15001 and 87005 gave the maximum yield 962 kg/ha and 942 kg/ha against the check TS-5 yield (848 kg/ha) where as the minimum yield 554 kg/ha was obtained from 70002.
- v. The entries NS-786 and NS-260-SP4 gave the maximum yield 645 kg/ha and 626 kg/ha, respectively against the check varieties TS-5, 563 kg/ha at different locations in NUSYT. Whereas our entry Black Til gave 566 kg/ha.

D. SOYBEAN

- i. In Preliminary yield trial, out of 15 entries tested, BSR-301 out yielded all entries by producing seed yield of 1837 kg/ha compared with Faisal Soybean (1611 kg/ha) and Ajmeri (582 kg/ha), the check varieties.
- ii. In advanced yield trial 7 entries were tested. 95-2 gave the best yield i.e. 1954kg/ha compared with the check varieties Faisal Soybean (1694 kg/ha) and Ajmeri (531 kg/ha).
- iii. In Micro yield trial, 7 entries were tested for their yield potential at 5 different locations. Promising line 95-1-14 gave highest yield 1424 kg/ha against the check varieties Faisal Soybean (1207 kg/ha) and Ajmeri (758 kg/ha).

- iv. In National Uniform Soybean Yield Trial (Kharif-2018), 95-1-14, an advanced line of ORI stood first with an average seed yield of 1793kg/ha.

E. LINSEED

- i. In Preliminary yield trial, out of 11 entries, LS18091 yielded maximum i.e., 1900 kg/ha seed yield as compared to Chandni (1402 kg/ha), the check variety.



Fig 2. Linseed at Flowering Stage, 90 days after sowing

- ii. In Advanced yield trial, 8 entries were evaluated. LS17007 produced maximum yield i.e. 2095 kg/ha in comparison with the check variety Chandni (1290 kg/ha).
- iii. In micro yield trial, 5 entries of Linseed were tested along with 2 checks at 4 locations in Punjab. On an average, LS14074 gave maximum seed yield of 1299 kg/ha while the check variety chandni yielded 1190kg/ha.

F. OIL TECHNOLOGY

Sunflower

- i. 57 samples of nineteen locally developed sunflower hybrids set I and 57 of set II (three replications of each) were tested for their oil contents. Maximum oil contents observed were, 38.5% (set I) and 41.04% (set II) in S 278.

- ii. 44 samples of sunflower restorer lines were tested for their oil contents. Maximum oil contents 44.60% were observed in RL 83.
- iii. 36 samples of sunflower hybrids (MYT) were tested for their oil contents. Maximum oil contents 42.96% were observed in FH 648.
- iv. Thirty six samples of sunflower hybrids (NUSYT) were tested for their oil contents. Maximum oil contents 43.39% were observed in 18009 while minimum oil contents were determined in 18005 (39.26%).

Brassica

- I. 147 samples of forty nine summer mustard lines (three replications of each) were tested for their oil contents. Maximum oil contents 45.40% were observed in B.J NURYT E22.
- II. 201 seed samples were analyzed for their fatty acid profile and Erucic acid through NIR. It was determined that number of lines having more than 40% Oleic acid (omega 9) were 52, more than 15% linoleic acid (omega 6) were 45, more than 8% linolenic acid (omega 3) were 13 and less than 2% Erucic acid were 32.

Soybean

Twenty lines of soybean were tested for their oil contents. Maximum oil contents 22.11 were observed in HM 8437 while minimum were estimated in DGS-16 (18.46%).

Sesame

66 samples of thirty two Sesame lines (three replications of each) were tested for their oil contents. Maximum oil contents 58.79% were observed in R-1 PYT 16003 while minimum were observed in R-1 MYT 86001 (45.76%).

G. OILSEEDS PATHOLOGY

MUSTARD:

During last year 2018-19 fourteen cultivars of *Brassica juncea* were screened against different diseases. In case of *Alternaria* blight (fig. 3 & 4) disease appeared ranged from 50-75%. Only two lines RBJ-15015 and BRJ-1452 have 50% disease incidence. Downy mildew appeared on *Brassica juncea* during the season. Minimum disease was 50% on RBJ-15019. White rust disease did not appear. No line was disease free.



Fig. 3. (*Alternaria Brassicae*) Blight on leaves Moist weather low temperature < 20°C

RAPeseed:

During 2018-19 Ten cultivars of *Brassica napus* were screened against different diseases. *Alternaria* blight disease was ranged 20-50%. Minimum disease was 20% on RBN-13022 and super canola. White rust disease was not appeared. No cultivar of *Brassica napus* was disease free.

Downy mildew appeared on *Brassica napus* during the season.

Minimum disease was 30% on RBN-13022.



Fig. 4 Blight (*Alternaria Brassica*) on siliques
Moist weather low temperature < 20°C.

SESAME:

During 2018 nine cultivars were screened against charcoal rot disease (fig. 5) which ranged for 10-50. Minimum disease was 10% on entry 15001 and 15002 while it was maximum on entry TH-6 that was 50% in sick field.



Fig. 5 (*Macrophomina phaseolina*)

Charcoal rot Hot humid weather
Temperature 30-35°C.

In case of phyllody (fig. 6), the disease ranged 5 to 20 %. Out of 09 lines screened, two lines name as 77011 and 15002 having minimum disease 5%.



Fig. 6 Phyllody of sesame, caused by
Phytoplasma (bacteria like organism)
Spread through leaf hoppers (insect vector)

H. OILSEED ENTOMOLOGY

- i. Eight promising strains of Sesame were sown to test their behavior against mirid bug, whitefly and leaf webber/pod borer under natural conditions. It was revealed that minimum population of mirid bug were recorded on line 70002 (1.32) while maximum was recorded at line 15001 (5.31). Mean population of mirid bug remained below ETL. Minimum population of whitefly was found on line 15001 (0.73) and maximum was found on line 86001 (1.54). Mean population of whitefly also remained below ETL. Maximum percent infestation was observed on line 70005 (7.69) while minimum infestation was recorded on line 15001 (4.22). Percent infestation of pod borer was below threshold level on three lines viz, 87005 (4.84%), 15001 (4.22%) and 86001 (4.73%).
- ii. Different doses of Acetamiprid (150-250 gram/acre) were applied when the population of whitefly reached at its ETL in Soybean.

Maximum percent mortality of whitefly was observed in dose applied at the rate of 250 g/acre (81.17%).

OILSEED RESEARCH STATION KHANPUR

- i.** In the preliminary yield trial of *B. juncea*, 17 entries were tested during 2018-19. The line KJ-282 was ranked first with seed yield of 3111 kg/ha while in *B. napus* KN-338 produced highest yield 2593 kg/ha.
- ii.** In advanced yield trial of *B. juncea*, 36 entries (in three different trials) were tested in Rabi season 2018-19. The advance lines KJ-256 and KJ-274 were found the out yielder with the seed yields of 3056 kg/ha and 3019 kg/ha respectively, while in *B. napus*, out of the 18 tested entries the highest yields of 2463 kg/ha and 2370 kg/ha were observed by KN-312 and KN-317 respectively.
- iii.** Among agronomic trials, *B. juncea* produced highest yield 2870 kg/ha at plant to plant spacing of 22.5 cm while *B. napus* yielded 2592 kg/ha at 15 cm.
- iv.** The highest Raya yield of 2222 kg/ha was achieved when it was broad casted in sugarcane.

OILSEED RESEARCH STATION BAHAWALPUR

- i.** In the preliminary yield trial of safflower, 12 entries were tested during 2018-19 in two trials A1 and A2. In A1 trial, the entry no. SAF-202 was ranked first with seed yield of 2158 kg/ha followed by SAF-205 that gave yield of 1537 kg/ha. In A2 trial, the entry no. SAF-168 was ranked first with seed yield of 1630 kg/ha followed by Thori-78 (Check) that gave yield of 1537 kg/ha.

- ii.** In the advanced yield trial of safflower, 10 entries were tested during 2018-19. The entry SAF-180 was ranked first with seed yield of 3700 kg/ha followed by Thori-78 (Check) that gave yield of 3000 kg/ha.

- iii.** In the micro yield trial of safflower, 10 entries were tested during 2018-19 in seven different agro-climatic conditions of Punjab. The entry SAF-62 was ranked first with seed yield of 2460 kg/ha in Bahawalpur but the yield data from other areas is not received yet.

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