CHAPTER II
AGRONOMY

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The agronomical trials conducted at different locations under All India Coordinated Research Project on Pearl Millet are presented in Table II.1. The plot history and agronomical operations carried out in these trials are briefly presented in Table II.2.

PMAT 1: Response of pearl millet advance hybrids and/or populations to different levels of nitrogen

Response of different advance hybrid entries (medium and late) under different levels of nitrogen in Zone A designated as PMAT 1b was conducted during *Kharif* season.

PMAT 1a: Performance of advance hybrids or populations to nitrogen levels in Zone A

The trial was conducted at two locations *i.e.* Bikaner & Mandor. Four advance hybrid entries MH 2672, MH 2673, MH 2675 and MH 2678 were tested for their response to four N levels (0, 20, 40 and 60 kg N/ha) in comparison with five hybrid checks *i.e.* HHB 67 (Imp.), MPMH 21, AHB 1200, PB 1756 and RHB 223 (c). Thus, 36 treatment combinations (Nine entries and four levels of nitrogen) were evaluated in split plot design, keeping N in main plots and entries in sub-plots. All the treatments were replicated for three times. The observations recorded on grain and stover yields along with other parameters are presented in Table II.3. The location wise performance of grain and stover yields of these advance entries at different N levels and against Zonal checks are described in the following paragraphs.

1.1 Bikaner: The grain as well as stover yields were not significantly increased with increase in doses of Nitrogen (N) from 0 to 60 kg/ha However, maximum grain yield (26.90 q/ha) and dry stover yield (57.66 q/ha) were recorded with the application of 60 kg N/ha which was found to be 28.2 percent higher in grain and 12.5 % more in dry stover yield compared to the control. The advance hybrid entry MH 2672 (26.95 q/ha), MH 2673 (26.78 q/ha) and MH 2678 (27.49 q/ha) produced significantly higher grain yield than all the checks except MPMH 21 (25.14 q/ha) and PB 1756 (25.23 q/ha). However, none of the advance entry except MH 2678 (59.20 q/ha) could surpass the stover yield of the check PB 1756 (58.90 q/ha).

1.2 Mandor: The grain and stover yields were significantly increased with successive increase in doses of Nitrogen (N) from 0 to 60 kg/ha. Maximum grain yield (18.72 q/ha) and dry stover yield (35.06 q/ha) were recorded with the application of 60 kg N/ha which was found to be 62.2, 31.3 and 7.3 percent higher in grain and 64.9, 33.4 and 10.5% more in dry stover yield compared to the grain and dry stover yields obtained by applying 0, 20 and 40 kg N/ha, respectively. The advance hybrid MH 2678 (16.83 q/ha) produced significantly higher grain yield than all the checks whereas entries MH 2673 (16.33 q/ha), and MH 2675 (16.03 q/ha) remained at par with the check MPMH 21 (15.78 q/ha). The advance hybrid entries MH 2678 (30.85 q/ha) and MH 2673 (30.04 q/ha) produced significantly higher stover yield than all the checks except the check MPMH 21 (29.83 q/ha). The test weight was significantly improved with incremental in the N doses up to 60 kg/ha over their lower doses. The test weight among all the tested hybrids was significantly lower than the three checks AHB 1200, PB 1756 and RHB 223.

Zonal performance – Zone A1

The mean data revealed that advance hybrid entries MH 2678 (22.16 q/ha) and MH 2673 (21.55 q/ha) were found higher grain yielder than the check HHB 67 Imp. (17.30 q/ha), AHB 1200 (17.30 q/ha) and RHB 223 (18.40 q/ha) but almost at par with the checks MPMH 21 (20.46 q/ha) and PB 1756 (20.24 q/ha). The dry stover yield was found superior in the advance entry MH 2678 (45.03 q/ha) comparable with the check PB 1756 (43.27 q/ha) but superior over the checks HHB 67 Imp. (38.36 q/ha) and AHB 1200 (39.73 q/ha). Maximum grain (22.81 q/ha) and stover (46.36 q/ha) yields were recorded with the application of 60 kg N/ha and it produced 40.2, 22.0 and 6.4% more grain yield whereas, stover yield was 27.8, 15.1 and 4.2% higher over application of 0, 20 kg and 40 kg N/ha, respectively. Days taken to 50% flowering were almost par with increasing nitrogen levels (45.1 to 46.1 days) over control (45.3 days) whereas, advance hybrid entry MH 2675 took maximum 46.0 days for 50% flowering but minimum by the MH 2678 (45.2 days) than all the checks with range of 45.3 to 45.8 days for 50% flowering. Total tillers/plant (3.9) and effective tillers/plant (3.6) were recorded highest in the entry MH 2678 than all the checks and other tested entries. None of the advance entry could surpass the test weight (8.2 to 8.7 g) of the best check PB 1756 (8.8 g)

PMAT 1b: Response of advance medium and late hybrid entries to nitrogen levels in Zone A

The trial was conducted at four locations *viz.* Hisar, Jamnagar, Jaipur and New Delhi. Three advance hybrid entries *i.e.* MH 2709. MH 2712 and MH 2717 were tested for its response to four N levels (0, 30, 60 and 90 kg N/ha) in comparison with five hybrid checks *i.e.* AHB 1200, 86M84, 86M86, KBH 108 and MP 7878(c). Thus, 32 treatment combinations (Eight entries and four levels of nitrogen) were evaluated in split plot design, keeping N in main plots and entries in sub-plots. All the treatments were replicated three times. The observations recorded on grain and stover yields along with other parameters are presented in Table II.4 and II.5. Location-wise performance of grain and stove yield of these advance entries at different N levels and against Zonal checks are described in the following paragraphs.

1.1 Hisar: The grain and dry stover yields were increased with successive increase in dose of Nitrogen (N) from 0 to 90 kg/ha. Maximum grain yield (39.90 q/ha) recorded with the application of 90 kg N/ha was found to be 40.4, 19.9 and 7.4 percent higher as compared to the grain yield obtained by applying 0, 30 and 60 kg N/ha, respectively whereas, stover yield was improved to the tune of 22.9, 8.6 and 3.5%, respectively. The advance hybrid entries MH 2717 (38.67 q/ha) and MH 2712 (36.44 q/ha) produced significantly higher grain yield than all the checks (30.84 -34.87 q/ha). The test weight in all the checks (10.5 -11.0g) was found at par as compared to the advance hybrid entries (10.1-11.0 g).

1.2 Jamnagar: The advance hybrid entries MH 2717 (33.99 q/ha) and MH 2712 (34.51 q/ha) produced significantly higher grain yield than all the checks (21.50 -30.44 q/ha) except MP 7878 (32.68 q/ha). The stover yield in the advance hybrid entry MH 2712 (52.25 q/ha) was found significantly higher than all the advance entries (42.43 to 47.40 q/ha) and checks (30.05 to 47.23 q/ha). The grain yield was significantly increased up to highest level of 90 kg N/ha (34.65 q/ha) as compared to the control (25.16 q/ha), 30 kg/ha (28.26 q/ha) and 60 kg N/ha (31.11 q/ha). The stover yield increased was significantly higher at 90 kg N/ha (48.46 q/ha) than control (37.99 q/ha) and 30 kg N/ha (42.41 q/ha) but remained statistically at par with 60 kg N/ha (45.18 q/ha).

The hybrid MH 2712 (206.1 cm) produced significantly taller plants than two advance hybrid entries and all the checks. The MH 2712 (12.6 g) and MH 2717 (11.2 g) hybrid entries recorded significantly higher test weight compared to the advance hybrid entry MH 2709 (10.6 g) and all the checks with range of test weight from 9.2 t0 10.6 g.

1.3 Jaipur: Maximum grain yield (25.08 q/ha) recorded with application of 90 kg N/ha was found significantly higher over the control (19.67 q/ha), 30 kg N/ha (21.70 q/ha) and 60 kg N/ha (22.57 q/ha) but 30 & 60 kg N/ha remained at par with each other. Significantly higher stover yield (58.68 q/ha) was also obtained with application of 90 kg N/ha than 0, 30 and 60 kg N/ha (46.01, 50.78 and 50.99 q/ha) but 30 and 60 kg/ha remained statistically at par. The performance of all the three advance entries MH 2709 (30.01 q/ha), MH 2712 (28.50 q/ha) and MH 2717 (27.39 q/ha) in terms of grain yield was found significantly superior than all the checks with grain yield of 17.34-21.83 q/ha). The stover yield of all the advance hybrid entries MH 2709 (70.21 q/ha), MH 2712 (66.67 q/ha) and MH 2717 (64.06 q/ha) was found significantly superior over all the checks (40.56-51.09 q/ha). The test weight was found significantly higher in the advance hybrid entry MH 2709 (11.8 g) than all the checks except 86M86 (11.8 g) and other advance hybrid entries. Days taken to 50% flowering were significantly higher in the MH 2709 entry (60.7 days) than both the advance hybrid entries MH 2712 (52.4 days) and MH 2717 (53.6 days) and among checks it varied from 50.8-55.9 days.

1.4 New Delhi: The performance of all the advance entries MH 2709 (29.11 q/ha) MH 2712 (28.18 q/ha) and MH 2717 (27.11 q/ha) in terms of grain yield was found significantly superior over the checks AHB 1200 (23.78 q/ha), MP 7878 (15.07 q/ha) and KBH 108 (23.87 q/ha) but remained at par with the checks 86M86 (26.94 q/ha). The stover yield in the advance entries MH 2709 (80.77 q/ha) and MH 2717 (79.10 q/ha) was found significantly superior over all the checks. Maximum grain yield (29.56 q/ha) recorded with application of 90 kg N/ha was found significantly higher over the control (19.93 q/ha), 30 kg N/ha (23.43 q/ha) and 60 kg N/ha (27.39 q/ha). Significantly higher stover yield (80.34 q/ha) was also obtained with application of 90 kg N/ha than 0, 30 and 60 kg N/ha (61.11, 70.55 q/ha and 77.94). The advance entry MH 2709 (237.5 cm) produced significantly taller plants except entry 2712 (234.7 cm) than other advance hybrid entry MH 2717 and all the checks. The entry MH 2709 (10.3 g) recorded significantly highest test weight compared to the check MP 7878 (7.8 g), AHB 1200 (9.3 g) and KBH 108 (9.6 g) but remained at par with other two checks and advance entries.

Zonal performance – Zone A

The mean data revealed that all the three advance hybrid MH 2709 (31.46 q/ha) MH 2712 (31.91 q/ha) and MH 2717 (31.79 q/ha) in terms of grain yield was found quite superior over all the checks *i.e.* AHB 1200 (23.78 q/ha), 86M86 (26.17 q/ha), 86M84 (27.87 q/ha), KBH 108 (25.83 q/ha) and MP 7878 (24.81 q/ha). The dry stover yield of all the advance hybrid entries MH 2709 (74.93 q/ha), MH 2712 (77.50 q/ha) and MH 2717 (76.54 q/ha) was found quite superior over all the checks (61.68-68.73 q/ha). Maximum grain (32.30 q/ha) and stover (76.71 q/ha) yields were recorded with the application of 90 kg N/ha and it produced 33.9, 21.1 and 9.3 % more grain yield whereas, stover yield was 26.7, 12.1 and 5.4% higher over application of 0, 30 kg and 60 kg N/ha, respectively. Days taken to 50% flowering were increased with increasing nitrogen levels over control whereas, advance hybrid entry MH 2709 took maximum number of days for 50% flowering (54.8) and minimum by the check AHB 1200 (46.2 days). Total tillers and

effective tillers/plant were recorded higher in the entry MH 2712 (3.4 and 2.7) and similarly the test weight (11.0 g). The checks recorded test weight in the range of 10.1-10.5 g).

PMAT 1c: Response of advance medium and late hybrid entries to nitrogen levels in Zone B

The trial was conducted at four locations *i.e.* Aurangabad, Dhule, Vijaypur & Coimbatore in Zone B. Two advance hybrid entries viz., MH 2682 and MH 2717 were tested for their response to four nitrogen levels (0, 30,60 & 90 kg N/ha) in comparison with seven national checks AHB 1200, 86M86, Pratap, 86M01, AHB 1269, NHB 4903 and Kaveri Super Boss. Thus, 36 treatment (9 hybrids and 4 nitrogen levels) combinations were evaluated in Split plot design (Nitrogen in main plot and entries in sub-plots) with three replications. The observations recorded on grain and stover yields along with other parameters are presented in Table II.6 to II.9. Centre wise performance of grain and dry fodder yield of these hybrids at different nitrogen levels are discussed in the following paragraphs.

1.5 Aurangabad: The grain yield in both the advance entries MH 2682 (22.16 q/ha) and MH 2717 (20.21 q/ha) were found statistically lower or at par yielder in comparison all the checks (20.18 to 26.89 q/ha) except the checks Pratap and 86M86. Similar trend was observed in the stover yield with range of 39.40 to 51.43 q/ha in the checks as compared to 44.55 to 46.43 q/ha in both the advance entries. The increasing levels of N from 60 kg/ha (23.15 q/ha) and 90 kg N/ha (24.31 q/ha) bring out significant improvement in the grain yield of pearl millet crop over the control (19.35 q/ha). The stover yield also followed the trend of grain yield with values of 48.05 q/ha (60 kg N/ha) and 50.99 q/ha (90 kg/ha) than 40.50 q/ha in control. The tested hybrid entries were found statistically lower stover yielder than the two checks i.e. AHB 1200 (50.81 q/ha) and AHB 1269 (51.43 q/ha) but at par with all the other checks.

1.6 Dhule: Increasing levels of N up to 90 kg/ha (25.18 q/ha) caused no significant improvement in the grain yield over the 30 (20.26 q/ha) and 60 kg N/ha (22.66 q/ha) and similar trend was observed for stover yield. The new advance hybrid entry MH 2717 (26.11 q/ha) performance in terms of grain yield was found significantly superior over all the checks whereas, the entry MH 2682 (24.50 q/ha) was found significantly superior over all the checks except AHB 1269 check (23.01 q/ha). Similarly the stover yield in MH 2717 exhibited its statistical superiority over all the checks. The yield attributing trait *viz*. test wt. was found significantly superior in the entry MH 2717 (12.3 g) in comparison to all the checks (11.8 to 12.1 g). The plant height was recorded significantly higher in the check Kaveri Super Boss (191.0 cm) than advance entry MH 2682 (184.1 cm) and MH 2717 (188.7 cm).

1.7 Vijaypur: The highest grain yield recorded with 90 kg N/ha (18.42 q/ha) was found significantly superior than control (8.47 q/ha), 30 kg N/ha (12.16 q/ha) and 60 kg N/ha (14.69 q/ha). The stover yield also exhibited the similar trend of grain yield with values of 28.94, 33.36, 38.90 and 45.84 q/ha in control, 30, 60 and 90 kg N/ha, respectively. The grain yield was recorded significantly higher in advance entry MH 2682 (15.25 q/ha) over all the checks except NHB 4903 (14.68 q/ha) and Kaveri Super Boss (14.43 q/ha). The stover yield also exhibited the similar trend of grain yield. The test weight was found statistically at par among the two advance entries with the seven checks.

1.8 Coimbatore: The grain yield was significantly increased up to 60 kg N/ha (35.67 q/ha) over control (28.17 q/ha) and 30 kg N/ha (32.72 q/ha) but remained at par with 90 kg N/ha (37.01 q/ha). The stover yield was significantly higher at 90 kg/ha (56.07 q/ha) over the control (44.1 q/ha) and 30 kg N/ha (51.17 q/ha) but remained at par to 60 kg N/ha (54.44 q/ha). The grain yield was found statistically at par among the two advance entries (35.40 to 36.90 q/ha) with three checks 86M86 (35.51 q/ha), 86M01 (35.90 q/ha), NHB 4903 (33.55 q/ha) and Kaveri Super Boss (37.24 q/ha) . The stover yield was found statistically at par in MH 2682 (54.78 q/ha) and MH 2717 (56.88 q/ha) entries as compared to the checks 86M86 (55.07 q/ha), 86M01 (55.35 q/ha) and Kaveri Super Boss (57.22 q/ha) but significantly superior than other checks. The total and effective tillers/plant were found significantly lower among the two advance entries as compared to two checks Pratap and 86M86 whereas, test weight was found significantly superior in the check Kaveri Super Boss (13.0 g) over all the checks (10.3-12.7 g) and two advance entries with range of 10.7 to 11.0 g .

Zonal performance – Zone B

The entry MH 2682 produced highest grain yield (24.32 q/ha) followed by MH 2717 (24.15 q/ha) but almost at par with Kaveri Super Boss (24.02 q/ha) whereas, range was between 19.59 – 23.74 q/ha among other remaining checks. The dry fodder yield was found superior in the entry MH 2717 (47.39 q/ha) followed by MH 2682 (46.62 q/ha) but almost at par with Kaveri Super Boss (47.06 q/ha) whereas, range was between 37.78–44.44 q/ha among other remaining checks. The grain yield at the highest level of 90 kg N/ha was found 40.5, 21.7 and 9.1% superior over control, 30 and 60 kg N/ha whereas, the stover yield was to the tune 31.2, 20.2 and 8.8%. The test weight was quite higher among all the checks (11.6-11.9 g) except 86M01 (11.2 g) than value of 11.4 g in both the advance entries.

PMAT 2: Response of pearl millet to foliar application of nano urea (New Experiment)

The applied nitrogen through fertilizers undergoes transformation processes such as biological nitrogen fixation, humus mineralization, immobilization and nitrification under acidic and alkaline pH, denitrification and volatilization. To address these challenges, the development and application of nano urea represent a promising innovation. Nano urea is a ground breaking agricultural input derived from nanotechnology, characterized by its ultra-small particle size ranging from 20 to 50 nm. To study the effect of foliar application of nano urea on growth, yield, quality and its suitable dose, the present experiment was started during *Kharif*, 2024 under irrigated condition at two locations of Zone A1 (Mandor and Bikaner), three locations each in Zone A (Jaipur, Jamnagar and Hisar) and four locations in Zone B (Aurangabad, Coimbatore, Vijayapur and Dhule). Ten treatments i.e. T1 : Control (No nitrogen),T2 :RDN(1/4 at basal, ½ after 3 weeks and ¼ after 5 weeks), T3 : 75% RDN + foliar spray of urea @ 1.5 % at 3 and 5 Weeks, T4 : 75% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 Weeks, T5 : 75% RDN + foliar spray of urea @ 2.5 % at 3 and 5 Weeks, T6 : 75% RDN + foliar spray of nano urea @ 4 ml/l between 3-4 Weeks of Sowing, T7 : 50% RDN + foliar spray of urea @ 1.5 % at 3 and 5 Weeks, T8 : 50% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 Weeks, T9: 50% RDN + foliar spray of urea @ 2.5 % at 3 and 5 Weeks, T10: 50% RDN + foliar spray of nano urea @ 4 ml/l between 3-4 Weeks of Sowing were replicated three times in RBD. Data on ancillary characters, yield attributes, yield and quality of pearl millet are presented in Table II.10 to II.22.

2.1 Bikaner: The data presented in the Table II.10 and 11 exhibited that the treatment T3: 75% RDN + foliar spray of urea @ 1.5 % at 3 and 5 Weeks (23.33 q/ha) and T5 : 75% RDN + foliar spray of urea @ 2.5 % at 3 and 5 Weeks (23.77 q/ha) produced statistical at par grain yield as compared to RDN along with recommended P & K (25.23 q/ha). The application of Nano Urea either @2.0 or 4.0 ml/l at 3 and 5 weeks after sowing along with 50 or 75 % RDN did not bring out significant improvement in the grain as well as dry fodder yields. Total tillers/plant, effective tillers/plant and test weight parameters were were found statistically at par among all the treatments.

2.2 Mandor: The perusal of the data in Table10-13 revealed that the treatment T6 (75% RDN + foliar spray of nano urea @ 4 ml/l between 3-4 Weeks of Sowing) produced statistically at par grain (16.97 q/ha) and stover (32.90 q/ha) yields as compared to RDN along with recommended P & K (19.13 q/ha grain; 38.43 q/ha dry fodder) whereas, other treatments of Nano Urea or Urea realized statistically lower grain and stover yields than the RDN treatment. N and protein content in grain were also found significantly higher in the T2 treatment as compared to all the treatments except T4 : 75% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 Weeks & T6: 75% RDN + foliar spray of nano urea @ 4 ml/l between 3-4 Weeks of Sowing. N content in fodder was found statistically at par in the T2 and T4 treatments. P content in grain and dry fodder was signicantly higher in the RDN treatments as compared to all other treatments. The economic evaluation of application of different treatments exhibited maximum gross returns (Rs. 75207/ha), net returns (Rs. 49707/ha) and BC ratio (2.95) in the treatment T2 *viz.* RDN along with P & K) which was followed by T6 treatment *viz.* 75% RDN + foliar spray of nano urea @ 4 ml/l between 3-4 Weeks of Sowing (Rs. 65923/ha, Rs. 38623/ha and 2.41, respectively.

Zonal performance – Zone A_1

The two locations mean data exhibited the superior performance of RDN treatment along with recommended P & K in terms of grain yield (22.18 q/ha). The next best treatment was found T5 : 75% RDN + foliar spray of urea @ 2.5 % at 3 and 5 Weeks (19.55 q/ha) which was followed by T6:75% RDN + foliar spray of nano urea @ 4 ml/l between 3-4 Weeks of Sowing (19.32 q/ha) and lowest in the control (14.00 q/ha). The stover yield was also found superior in RDN treatment along with recommended P & K (44.00 q/ha) and it was followed by T6:75% RDN + foliar spray of nano urea @ 4 ml/l between 3-4 Weeks after Sowing (38.80 q/ha) T5 : 75% RDN + foliar spray of urea @ 2.5 % at 3 and 5 Weeks after Sowing (37.10 q/ha) treatments.

At Mandor location, N and protein content in grain were also found significantly higher in the T2 treatment as compared to all the treatments except T4 : 75% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 Weeks & T6: 75% RDN + foliar spray of nano urea @ 4 ml/l between 3-4 Weeks of Sowing. N content in fodder was found statistically at par in the T2 and T4 treatments. P content in grain and dry fodder was signicantly higher in the RDN treatments as compared to all other treatments. The economic evaluation of application of different treatments exhibited maximum gross returns (Rs. 75207/ha), net returns (Rs. 49707/ha) and BC ratio (2.95) in the treatment T2 *viz.* RDN along with P & K) which was followed by T6 treatment *viz.* 75% RDN + foliar spray of nano urea @ 4 ml/l between 3-4 Weeks of Sowing (Rs. 65923/ha, Rs. 38623/ha and 2.41, respectively.

2.3 Hisar:
The study revealed that neither of the treatment could statistically produced grain (39.71 q/ha) and stover (115.44 q/ha) yields to the tune of the treatment RDN along with recommended P & K. The next best treatment was found T6 (75% RDN + foliar spray of nano urea @ 4 ml/l between 3-4 Weeks of Sowing) with grain yield of 35.87 q/ha and stover yield of 107.93 q/ha whereas, other treatments of Nano Urea or Urea realized significantly grain yield between 30.88-35.19 q/ha and stover yield from 93.57-106.65 q/ha. N and protein content in grain as well as in dry fodder were also found significantly higher in the T2 treatment as compared to all the treatments except T3 to T6 treatment having 75 % RDN through Urea and remaining N with foliar spray of Nano Urea or Urea. P & K content content in grain and P in fodder were found statistically at par among all the treatments. K content in dry fodder fodder was signicantly higher among all the other treatments as compared to control. The economic evaluation of application of different treatments exhibited maximum gross returns (Rs. 127327/ha), net returns (Rs. 73005/ha) and BC ratio (2.34) in the treatment T2 *viz.* RDN along with P & K) which was followed by T6 treatment *viz.* 75% RDN + foliar spray of nano urea @ 4 ml/l between 3-4 Weeks of Sowing (Rs. 115744/ha, Rs. 60232/ha and 2.09, respectively.

2.4 Jamnagar: The study revealed that the treatment T4 (75% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 Weeks) and T6 (75% RDN + foliar spray of nano urea @ 4 ml/l between 3-4 Weeks of Sowing) produced statistically at par grain (28.91 q/ha & 30.16 q/ha) and stover (45.10 & 46.16 q/ha) yields as compared to RDN along with recommended P & K (31.30 q/ha grain; 48.23 q/ha dry fodder) whereas other treatments of Nano Urea or Urea realized statistically lower grain and stover yields than the RDN treatment. Similar trend was also found for N and protein content in grain whereas, P content in dry fodder were also found significantly higher in the T2 treatment as compared to all the treatments except T3 to T6 treatment having 75 % RDN through Urea and remaining N with foliar spray of Nano Urea or Urea. The gross returns (Rs. 83073/ha), net returns (Rs. 58749/ha) and BC ratio (3.42) in the treatment T2 were maximum which was followed by T6 treatment *viz.* 75% RDN + foliar spray of nano urea @ 4 ml/l between 3-4 Weeks of Sowing (Rs. 80016/ha, Rs. 53625/ha and 3.03, respectively) and noticed higher compared to all the treatments including control (Rs. 45761/ha, Rs. 22416/ha and 1.96, respectively).

2.5 Jaipur: In comparison to Hisar and Jamnagar centres, the performance of the treatment T2 i.e. RDN along with recommended P & K (25.38 q/ha grain; 60.50 q/ha dry fodder) was found statistically at par with all the 75 & 50 % RDN treatment combinations with foliar spray of urea and Nano Urea (T3 to T10) with grain yield between 25.46 to 27.35 q/ha. However, all the treatments (T2 to T10) produced significantly higher grain as well as dry fodder yield than the control (20.52 q/ha grain; 52.35 q/ha fodder).

Zonal performance – Zone A

The Zonal mean data in the Tables 14 to 17 showed that the treatment RDN along with recommended P & K in produced highest grain yield (32.13 q/ha) and dry fodder yield (74.73 q/ha). The next best treatment was found T6:75% RDN + foliar spray of nano urea @ 4 ml/l between 3-4 Weeks of Sowing (31.20 q/ha grain; 72.98 q/ha dry fodder) which was followed by

T4: 75% RDN + foliar spray of nano urea @ 2 ml/l at 3 & 5 Weeks of Sowing (29.75 q/ha grain) and lowest in the control (20.59 q/ha grain; 52.95 q/ha dry fodder).

N (1.54 %) and protein content (9.65%) in grain as well as N in dry fodder (0.99 %) were also found higher in the T2 treatment as compared to all the treatments with range of N content between 1.37-1.41%. and protein content from 8.62 to 9.19 % and lowest in control (1.29% and 8.06%), respectively. The economic evaluation of application of different treatments exhibited maximum gross returns (Rs. 105200/ha), net returns (Rs. 65877/ha) and BC ratio (2.88) in the treatment T2 *viz.* RDN along with P & K) which was followed by T6 treatment *viz.* 75% RDN + foliar spray of nano urea @ 4 ml/l between 3-4 Weeks of Sowing (Rs. 97880/ha, Rs. 56929/ha and 2.56, respectively.

2.6 Aurangabad: The data presented in Table II.18 to 22 clearly indicated that the performance of the treatment T2 i.e. RDN along with recommended P & K (24.00 q/ha grain; 53.76 q/ha dry fodder) was found statistically at par with all the 75 & 50 % RDN treatment combinations with foliar spray of urea and Nano Urea (T3 to T10) with grain yield between 23.49 to 27.05 q/ha and dry fodder yield between 52.62 to 62.48 q/ha. However, all the treatments (T2 to T10) produced significantly higher grain as well as dry fodder yield than the control (16.57 q/ha grain; 37.13 q/ha fodder).The gross returns (Rs. 92283/ha) and net returns (Rs. 62083/ha) were noticed highest in the T6 (75% RDN + foliar spray of nano urea @ 4 ml/l between 3-4 Weeks of Sowing) compared to all the treatments including control (Rs. 56327/ha and Rs. 28827/ha, respectively) whereas, BC ratio was noticed highest in T10 treatment (3.09).

2.7 Dhule: Grain and dry fodder yields were also found significantly higher in the T2 treatment as compared to all the treatments except T3 to T6 treatment having 75 % RDN through Urea and remaining N with foliar spray of Nano Urea or Urea. The gross returns (Rs. 81903/ha), net returns (Rs. 51809/ha) and BC ratio (2.72) in the treatment T2 were maximum which was followed by T5 : 75% RDN + foliar spray of urea @ 2.5 % at 3 and 5 Weeks (Rs. 78014/ha, Rs. 47064/ha and 2.52, respectively) and noticed higher compared to all the treatments including control (Rs. 51033/ha, Rs. 22707/ha and 1..80, respectively). N & P content in grain and stover as well as Protein content in grain were found statistically at par among all the treatments including control. The available N in soil after harvest was found higher in the T2 treatment (202.0 kg/ha) as compared to all the treatments with range of 176.0 to 198.0 kg N/ha.

2.8 Vijaypur: The perusal of the data (Table II.18 to 22) revealed that the treatment RDN along with recommended P & K produced highest grain yield (23.77 q/ha) but at par with T5 : 75% RDN + foliar spray of urea @ 2.5 % at 3 and 5 Weeks (22.09 q/ha), T3 : 75% RDN + foliar spray of urea @ 1.5 % at 3 and 5 Weeks (20.99 q/ha) and T6:75% RDN + foliar spray of nano urea @ 4 ml/l between 3-4 Weeks of Sowing (20.84 q/ha). The T2 treatment produced significantly higher grain yield than all remaining treatments. The dry fodder yield was found statistically at par among all the treatments. The gross returns (Rs. 55862/ha), net returns (Rs. 38885/ha) and B:C (3.29) were maximum in T2 treatment as compared to all other treatments with net returns ranges from Rs. 18780 to 33917/ha in T3 to T10 treatments and minimum in control (Rs. 35593/ha, Rs. 21277/ha, 2.49, respectively). Protein and N content in grain were found statistically at par among T2 to T10 treatments however, exhibited significantly

superiority over the control. N & P content in dry fodder were not significantly effected by different treatments.

3.10 Coimbatore: The study revealed that the the performance of the treatment T2 i.e. RDN along with recommended P & K (27.72 q/ha grain; 42.22 q/ha dry fodder) was found statistically at par with all the 75 % RDN treatment combinations with foliar spray of urea and Nano Urea (T3 to T6) with grain yield between 27.11 to 31.12 q/ha and dry fodder yield between 41.17 to 47.09 q/ha and all these treatments produced significantly higher grain and stover yield than control and T7 to T10 treatments. N,P and protein content in grain as well as in dry fodder were also found significantly higher in the T2 and T3 to T6 treatments having 75 % RDN through Urea and remaining N with foliar spray of Nano Urea or Urea as compared to all the other treatments.The gross returns (Rs. 77862/ha), net returns (Rs. 37978/ha) and BC ratio (1.95) in the treatment T6 treatment *viz.* 75% RDN + foliar spray of nano urea @ 4 ml/l between 3-4 Weeks of Sowing were maximum which was followed by T4 (Rs. 77027/ha, Rs. 36143/ha and 1.88, respectively) and noticed higher compared to all the treatments including control (Rs. 64350/ha, Rs. 23934/ha and 1.59, respectively).

Zonal performance – Zone B

The four locations mean data exhibited the superior performance of RDN treatment along with recommended P & K in terms of grain yield (26.61 q/ha). The next best treatment was found T5: 75% RDN + foliar spray of urea @ 2.5% at 3 and 5 Weeks (26.42 q/ha) which was followed by T6:75% RDN + foliar spray of nano urea @ 4 ml/l between 3-4 Weeks of Sowing (26.39 q/ha) and lowest in the control (17.51 q/ha). The stover yield was found superior in T6:75% RDN + foliar spray of nano urea @ 4 ml/l between 3-4 Weeks of Sowing (52.63 q/ha) followed by treatment RDN along with recommended P & K (52.22 q/ha) and T5 : 75% RDN + foliar spray of urea @ 2.5 % at 3 and 5 Weeks (52.02 q/ha) treatment.

The protein content was between 11.6 to 11.8 % in T2 to T6 treatments was quite higher over 11.1 to 11.3 % in T7 to T10 treatments and with value of 10.0 % in control. Similar trend was observed in N content in grain with values of 1.75 to 1.79 %, 1.60-1.68 % and 1.50%, respectively. P content in grain (0.34-0.36%) as well as fodder (.018-0.21%) was not much variable among T2 to T10 treatments but showed their superiority over control with values of 0.32 % and 0.17 %, respectively. The net returns (Rs. 42608/ha) and BC ratio (2.59) in the treatment T2 were maximum which was followed by T6 treatment *viz.* 75% RDN + foliar spray of nano urea @ 4 ml/l between 3-4 Weeks of Sowing (Rs. 42383/ha and 2.48, respectively) and noticed higher compared to all the treatments including control (Rs. 20834/ha and 1.90, respectively).

PMAT 3: Response of pearl millet to application of Nano DAP (New Experiment)

Many soils of the semi-arid tropics are deficient in available P and under such adverse conditions, the establishment of pearl millet seedlings is a critical step to achieve satisfactory crop stands. To increase the phosphorus use efficiency and minimize the fixation of phosphatic fertilizers, nano phosphatic fertilizer may be the best alternative to increase phosphorus use efficiency as well as other nutrient and protein content. Nano-fertilizers, like Nano DAP developed by IFFCO's Nano Biotechnology Research Centre in Gujarat, offer a new approach to nutrient delivery. This experiment was planned and started during *kharif* 2024 at two locations

of Zone A1 (Mandor and Bikaner), three locations in Zone A (Jaipur, Jamnagar and Hisar) and four locations in Zone B (Aurangabad, Coimbatore, Vijayapur and Dhule) to study the effect of application of Nano DAP on growth, yield, quality and to find out its suitable dose. The experiment comprises of 10 treatments was evaluated in RBD keeping three replications. Treatments were T1 : Control (No Phosphorus), T2 :RDF, T3 : 75% RDP + seed treatment of nano DAP 5 ml/kg seed, T4 : 50% RDP + seed treatment of nano DAP 5 ml/kg seed, T5 : T3 + foliar spray of nano DAP 2.5 ml/l at 3 Weeks After Sowing, T6 : T3 + foliar spray of nano DAP 5.0 ml/l at 3 Weeks After Sowing, T7 : T3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 Weeks After Sowing, T8 : T4 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 Weeks After Sowing, T9: T3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 Weeks After Sowing and T10: T4 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 Weeks After Sowing. The result of the experiment are discussed in the following paragraphs and data are presented in Tables II.23 to 37.

3.1 Bikaner: The perusal of the data in the Table II.23 and 26 revealed that grain yield was found statistically at par among all the treatments, however, maximum was in the T2 treatment (RDF) with yield of 28.23 q/ha. The variation was between 21.00 to 25.33 q/ha among T3 to T10 treatments with lowest in control (19.53 q/ha). The application of Nano DAP either as seed treatment or foliar spray in combinations did not bring out significant improvement in the dry fodder yield among T2 to T10 (60.47 to 71.37 q/ha) treatments but significantly higher over the control (47.33 q/ha). Total tillers/plant and effective tillers/plant were significantly higher in the RDF treatment as compared to all the treatments whereas, test weight was found statistically at par among all the treatments.

3.2 Mandor: The T2 (RDF) treatment produced statistically at par grain yield (20.23 q/ha) as compared to T7: T3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 Weeks After Sowing (17.37 q/ha) and T9: T3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 Weeks After Sowing (18.03 q/ha) but it was significantly superior than all other treatments. However, T2 (RDF) treatment realized statistically superior dry fodder yield as compared to all the treatments (T3 to T10) including control (T1). Total tillers/plant and effective tillers/plant were significantly higher in the RDF treatment except T9 treatment as compared to all the treatments whereas, test weight was found statistically at par among all the treatments. N, P and protein content in grain as well as in dry fodder were also found significantly higher in the T2 (RDF) treatment as compared to all the treatments except T9: T3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 Weeks After Sowing treatment. The T2 (RDF) treatment exhibited maximum gross returns (Rs. 79459/ha), net returns (Rs. 53959/ha) and BC ratio (3.12) which was followed by T9: T3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 Weeks After Sowing (Rs.69156/ha, Rs. 43656/ha and 2.71, respectively) and minimum in control (Rs. 43840/ha, Rs. 20540/ha and 1.88, respectively)

Zonal performance – Zone A_1

The mean data exhibited the superior performance of RDF treatment in terms of grain yield (24.23 q/ha). The next best treatment was T9: T3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 Weeks After Sowing (21.68 q/ha) which was followed by T7 : T3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 Weeks After Sowing (20.92 q/ha) and lowest in the control (15.57 q/ha). The stover yield was also found superior in RDF treatment (55.95 q/ha) and it was followed by T9: T3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 Weeks After Sowing (52.05 q/ha) which was followed by T6 :T3 + foliar spray of nano DAP 5.0 ml/l at 3 Weeks After Sowing (52.10 q/ha)

and T7 : T3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 Weeks After Sowing (52.05 q/ha) and minimum in the control (33.97 q/ha).

N, P and protein content in grain as well as in dry fodder were found significantly higher in the T2 (RDF) treatment as compared to all the treatments except T9: T3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 Weeks After Sowing treatment. The T2 (RDF) treatment exhibited maximum gross returns (Rs. 79459/ha), net returns (Rs. 53959/ha) and BC ratio (3.12) which was followed by T9: T3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 Weeks After Sowing (Rs. 69156/ha, Rs. 43656/ha and 2.71, respectively) and minimum in control (Rs. 43840/ha, Rs. 20540/ha and 1.88, respectively)

3.3 Hisar: The data presented in Tables 27-31 indicated that neither of the treatments could statistically produce grain (37.12 q/ha) and stover (114.87 q/ha) yields to the tune of the treatment T2 (RDF). The next best treatment was found T9: T3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 Weeks After Sowing with grain yield of 33.29 q/ha and stover yield of 109.04 q/ha whereas, other treatments produced grain yield between 20.54-33.16 q/ha and stover yield from 70.67-108.03 q/ha. Test weight and effective tillers/plant were significantly higher in the RDF treatment as compared to all the treatments whereas, Total tillers/plant were found statistically at par among all the treatments.

N and protein content in grain were found significantly higher in the T2 (RDF) treatment as compared to all the treatments except T9: T3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 Weeks After Sowing treatment. P content in grain was found significantly superior in T2 (RDF) treatment as compared to T1 (Control) and T4 : 50% RDP + seed treatment of nano DAP 5 ml/kg but at par with other treatments. Available P and K were not significantly effected by different treatments. Maximum gross returns (Rs. 120415/ha), net returns (Rs. 66093/ha) and BC ratio (2.22) were received in RDF treatment which was followed by T7: T3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 Weeks After Sowing in terms of net returns (Rs. 51076/ha), T3 in B:C (1.91) and minimum in control (Rs. 68052/ha, Rs. 17350/ha and 1.34, respectively).

3.4 Jamnagar: The perusal of the data in Tables27-31 exihibited that the T2 (RDF) treatment produced statistically at par grain (24.71 q/ha) and dry fodder (41.33 q/ha) yields as compared to T7 : T3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 Weeks After Sowing (21.96 q/ha grain;41.33 q/ha dry fodder), T9: T3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 Weeks After Sowing (24.41 q/ha grain; 39.14 q/ha dry fodder) and T6 : T3 + foliar spray of nano DAP 5.0 ml/l at 3 Weeks After Sowing (20.16 q/ha grain; 35.63 q/ha dry fodder)) but it was significantly superior than all other treatments. Similar trend was also found for ancillary characters i.e. total tillers/plant, effective tillers/plant and test weight. N, P and protein content in grain and dry fodder also followed the trend of grain yield.

3.5 Jaipur: The performance of the treatment T2 i.e. RDF was found significantly lower than T6 : T3 + foliar spray of nano DAP 5.0 ml/l at 3 Weeks After Sowing, T7 : T3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 Weeks After Sowing, T8 : T4 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 Weeks After Sowing, T9: T3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 Weeks After Sowing and T10: T4 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 Weeks After Sowing traetments whereas, dry fodder yield also followed the trends of grain yield except T6 treatment

which remained at par to RDF treatment. Total tillers/plant and effective tillers/plant were found significantly higher in the T6 to T10 treatments as compared to RDF whereas, test weight was found statistically at par among all the treatments.

Zonal performance – Zone A

The Zonal mean data in the Tables 27-31 showed that the treatment T9: T3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 Weeks After Sowing produced highest grain yield (29.55 q/ha) and dry fodder yield (73.90 q/ha) followed by RDF treatment in grain yield (28.99 q/ha but by T7 : T3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 Weeks After Sowing in fodder yield (72.62 q/ha). Test weight was higher in the RDF treatment as compared to all the treatments whereas, no definite trend was found for total & effective tillers/plant among the treatments.

N (1.57 %), P (0.36 %) and protein content (10.04 %) in grain were found higher in the RDF (T2) treatment as compared to all the treatments with range of N content between 1.40-1.55 %. and protein content from 8.94 to 10.55 % and lowest in control (1.39% and 8.79%). The economic evaluation of application of different treatments exhibited maximum gross returns (Rs. 93161/ha), net returns (Rs. 53933/ha) and BC ratio (2.47) in the treatment T2 *viz.* RDF which was followed by T9: T3 + foliar spray of Nano DAP 5.0 ml/l at 3 & 5 Weeks After Sowing (Rs. 87067/ha and Rs. 41501/ha, respectively) whereas BC was second best in T3: 75% RDP + seed treatment of nano DAP 5 ml/kg seed treatment (2.05).

3.6 Aurangabad: The data presented in Table II.27-31 and 47 clearly indicated the performance of the treatment T2 i.e. RDF (26.93 q/ha grain; 58.48 q/ha dry fodder) was found statistically at par with all the 75 & 50 % RDP treatment combinations with foliar spray of Nano DAP (T3 to T10) with grain yield between 22.42 to 26.75 q/ha and dry fodder yield between 48.24 to 57.02 q/ha. However, all the treatments (T2 to T10) produced significantly higher grain as well as dry fodder yield than the control (16.08 q/ha grain; 34.84 q/ha fodder).The gross returns (Rs. 91124/ha), net returns (Rs. 59624/ha) and B:C were noticed highest in the T2 i.e. RDF treatment which was followed by T9: T3 + foliar spray of Nano DAP 5.0 ml/l at 3 & 5 Weeks After Sowing (Rs. 90329/ha and Rs. 59479/ha and 2.93, respectively) and lowest in control (Rs. 54410/ha and Rs. 27910/ha and 2.02, respectively).

3.7 Dhule: Grain yield and dry fodder yield were found significantly higher in the T2 treatment as compared to all the treatments except T5 to T7 treatments having 75 % RDP through DAP and remaining with foliar spray of Nano DAP. Total tillers/plant, effective tillers/plant and test wt. were at par among T2 to T10 treatments but significantly superior over control.The gross returns (Rs. 81513/ha), net returns (Rs. 51419/ha) and BC ratio (2.71) in the treatment T2 were maximum which was followed by T7 : T3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 Weeks After Sowing in terms of gross returns (Rs. 77148/ha) and net returns/ha (Rs. 43147/ha), respectively but B:C in T3 treatment (2.37) and noticed higher compared to all the treatments including control (Rs. 47828/ha, Rs. 19984/ha and 1.72, respectively).

N & P content in grain and stover as well as protein content in grain were found statistically at par among all the treatments including control. The available N in soil after harvest was found higher in the T2 treatment (202.0 kg/ha) as compared to all the treatments with range of 192.0 to

198.0 kg N/ha. The available P in soil after harvest was found at par among T2 to T10 treatments (15.9 kg/ha) but more than control (13.6 kg/ha).

3.8 Vijaypur: The data in the Table II.27-31 revealed that the grain yield, dry fodder yield, test weight and economics of different DAP and Nao DAP applied treatments were found statistically at par among all the treatments in comparison to control. Protein and N content in grain and dry fodder were found statistically at par among all the treatments. P content in grain was found significantly higher in the RDF (T2) treatment over all the other treatments except T8 to T10 treatments. Available N, P and K were quite higher in T2 to T10 treatments as compared to control.

3.10 Coimbatore: The T2 (RDF) treatment produced statistically at par grain and dry fodder yields (30.63 and 46.74 q/ha) as compared to T5 : T3 + foliar spray of nano DAP 2.5 ml/l at 3 Weeks After Sowing (31.09 and 47.81 q/ha), T6 : T3 + foliar spray of nano DAP 5.0 ml/l at 3 Weeks After Sowing (28.69 and 43.98 q/ha), T7 : T3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 Weeks After Sowing (31.93 and 48.44 q/ha), T9: T3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 Weeks After Sowing (31.99 and 48.92 q/ha)and T10: T4 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 Weeks After Sowing (28.53 and 42.92 q/ha) but it was significantly superior than all other treatments. N,P and protein content in grain as well as in dry fodder were also found significantly higher in T9: T3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 Weeks After Sowing than all the other treatments except T2 (RDF), T5 : T3 + foliar spray of nano DAP 2.5 ml/l at 3 Weeks After Sowing and T7 : T3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 Weeks After Sowing treatments.

The gross returns (Rs. 80057/ha), net returns (Rs. 41469/ha) and BC ratio (2.07) in the T9: T3 + foliar spray of Nano DAP 5.0 ml/l at 3 & 5 Weeks After Sowing were maximum which was followed by T5 : T3 + foliar spray of nano DAP 2.5 ml/l at 3 Weeks After Sowing in terms of net returns i.e. Rs. 40450/ha and B:C *viz.* 2.08, respectively and noticed higher compared to all the treatments including control (Rs. 55883/ha, Rs. 19795/ha and 1.55, respectively).

Zonal performance – Zone B

The four locations mean data exhibited the superior performance of RDF treatment in terms of grain yield (27.63 q/ha) and dry fodder yield (56.17 q/ha). The next best treatment was found T7: T3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 Weeks After Sowing (26.97 and 53.93 q/ha) which was followed by T9: T3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 Weeks After Sowing (26.77 and 53.12 q/ha) and lowest in the control (18.57 and 39.14 q/ha). The protein content was between 10.49 to 11.39% in T2 to T10 treatments and value of 10.48% in control. Similar trend was observed for N content in grain with values of 1.52 to 1.69% and 1.53%, respectively. P content in grain (0.32-0.37%) as well as fodder (0.18-0.21%) was variable among T2 to T10 treatments but showed their superiority over control with values of 0.30 % and 0.17 %, respectively. The T2 (RDF) treatment exhibited maximum gross returns (Rs. 75346/ha), net returns (Rs. 46181/ha) and BC ratio (2.67) which was followed by T9: T3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 Weeks After Sowing in terms of gross returns (Rs.72748/ha) but net returns (Rs.41751/ha) in T7 treatment and B:C (2.39) in T5 wheras, minimum in control (Rs. 49980/ha, Rs. 23557/ha and 2.02, respectively).

PMAT 4: Diversifying, enhancing production of millets through intercropping with pearl millet

The trail was started during *kharif*, 2024 with an objective to diversify, enhancing production of millets through intercropping with pearl millet at two locations in Zone A (Jamnagar and Hisar) and three locations in Zone B (Aurangabad, Coimbatore and Vijyapur). Eleven treatments i.e. 6 Sole crops of millets/green gram and 5 intercropping systems with pearl millet of different millets in paired rows at 30 cm: 2 rows of intercrop at 30 cm with each strip of 90 cm were evaluated in RBD with three replications. The details of the treatments are as follow; T1: Sole Pearl millet (45 cm x 10 cm), T2: Sole Proso millet (30 cm x 5 cm), T3: Sole Foxtail millet (30 cm x 5 cm), T4: Sole Little millet (30 cm x 5 cm), T5: Sole Barnyard millet (30 cm x 5 cm), T6: Sole Mungbean, T7: Pearl millet + Proso millet (2:2) 2 rows of PM paired at 30 cm: 2 rows of intercrop at 30 cm, T8: Pearl millet + Foxtail millet (2:2) 2 rows of PM paired at 30 cm: 2 rows of intercrop at 30 cm, T9:Pearl millet + Little millet (2:2) 2 rows of PM paired at 30 cm: 2 rows of intercrop at 30 cm, T10: Pearl millet + Barnyard millet (2:2) 2 rows of PM paired at 30 cm: 2 rows of intercrop at 30 cm, T11: Pearl millet + Mungbean (2:2) 2 rows of PM paired at 30 cm: 2 rows of intercrop at 30 cm, The results of the experiment are discussed in the following paragraphs and data presented in Tables II.38-41.

4.1 Hisar: The perusal of the data in the Table 38-39 revealed that the grain yield of pearl millet in sole stand was 41.88 q/ha as compared to 32.92-39.07 q/ha in different intercropping systems. The respective yield was 5.42, 3.93, 9.65 and 3.90 q/ha as sole crops of proso millet, foxtail millet, barnyard millet and mungbean, respectively. The dry fodder yields were 118.57 q/ha, 99.68-116.53 q/ha and 26.28, 20.46, 55.33 and 10.77 q/ha, respectively. Neither of the sole minor millets and intercropping based treatment could could surpass the grain yield of sole pearl millet equivalent yield (50.92 q/ha) which was significantly superior than all the treatments (1.56 to 47.86 q/ha) except mungbean based intercropping system (50.69 q/ha). Maximum gross returns, net returns and BC ratio of Rs. 133657/ha, Rs. 86159/ha and 2.51 were achieved in the sole pearl millet crop (T1) which was followed by T11 (Pearl millet + Mungbean intercropping system) treatment (Rs.133061ha, Rs.84963/ha and 2.86). The sole crop cultivation of minor millets was not found economical.

4.2 Jamnagar: The data presented in the Tables 38-39 revealed that the grain yield was realized 11.30, 10.28, 20.18, 23.38 and 12.67 q/ha by proso millet, foxtail millet, little millet, barnyard millet and mungbean crops in comparison to 24.49 q/ha by sole pearl millet crop. The range of pearl millet yield was between 12.54 – 19.99 q/ha among different intercropping systems. The straw yield was highest in the little millet crop (63.52 q/ha) followed by barnyard millet (55.52 q/ha) and 37.27 q/ha in pearl millet crop. The PMEY was significantly highest in the pearl millet + mungbean intercropping system (41.43 q/ha) than all the treatments. All the intercropping systems and sole crops of barnyard, little millet and mungbean produced significantly higher yield than sole pearl millet crop. Maximum gross returns, net returns and BC ratio of Rs. 103575/ha, Rs. 68527/ha and 2.2.96 were exhibited by T11 (Pearl millet + Mungbean intercropping system) treatment which was followed by sole mung bean in terms of gross returns (Rs.95025/ha), by sole barnyard in net returns (Rs.67526/ha) whereas maximum B:C in the sole little millet treatment (T4)

Zonal performance – Zone A

The mean data of two locations revealed that the pearl millet equivalent grain yield (46.06 q/ha) was highest in the T11 (Pearl millet + Mungbean intercropping system) treatment which was followed by pearl millet + barnyard (41.22 q/ha), pearl millet + little millet (39.10 q/ha) and sole pearl millet crop (37.70 q/ha), respectively. In rest of the treatments the PMEY was between 11.06 – 37.69 q/ha. The economic evaluation of the treatments revealed that gross returns (Rs. 118318/ha), net returns (Rs. 76745/ha) and B:C (2.86) were highest in the T11 (Pearl millet + Mungbean intercropping system) treatment which was followed by T10: Pearl millet + Barnyard millet treatment (Rs.106033/ha, Rs.64856/ha and 2.58) and only these two have more yield and economic returns than sole crop of pearl millet (Rs.97441/ha, Rs. 59799/ha and 2.51, respectively).

4.3 Aurangabad: The data presented in the Tables 40-41 revealed that the grain as well as stover yield of pearl millet was quite higher (26.83 q/ha & 58.35 q/ha) in the sole pearl millet as compared to grain yield of minor millets between 8.69-11.55 q/ha and dry fodder yield between 16.28-27.02 q/ha. The pearl millet grain yield was drastically reduced by intercropping treatments (13.95-16.10q/ha). The PMEY was significantly higher in the sole pearl millet (30.79 q/ha) and pearl millet + mungbean intercropping system treatment (31.09 q/ha) than all the sole crops of minor millets and mungbean crop. However, the intercropping systems with proso millet, foxtail millet and little millet produced at par PMEY compared to sole pearl millet crop. Maximum gross returns, net returns and BC ratio of Rs. 59830/ha, Rs. 3079/ha and 2.93 were exhibited by sole pearl millet which was followed by T11 (Pearl millet + Mungbean intercropping system) treatment with gross returns (Rs.59707/ha), net returns (Rs.3109/ha) and B:C (2.87)

4.4 Vijayapur: The perusal of the data in the Table 40-41 revealed that the pearl millet grain yield was found at par among different intercropping systems (15.65-17.25 q/ha) as compared to sole pearl millet crop (17.10 q/ha). However, the dry fodder yield was drastically reduced from 53.63 q/ha in sole pearl millet to 34.76-37.79 q/ha among different intercropping systems. The grain yield among minor millets was highest in proso millet (14.62 q/ha) which was followed by barnyard millet (13.73 q/ha), foxtail millet (12.69 q/ha), little millet (11.41 q/ha) and minimum in mung bean (10.41 q/ha). The PMEY was found highest in the pearl millet + foxtail millet treatment (28.26 q/ha) which was followed by pearl millet + barnyard millet (28.26 q/ha), pearl millet + mung bean (26.30 q/ha) and pearl millet + proso millet (25.14 q/ha) and quite higher than sole pearl millet (17.10 q/ha). Maximum gross returns, net returns and BC ratio of Rs. 66396, Rs. 48798/ha and 3.77 were realized in pearl millet + foxtail millet treatment and followed the trend of PMEY.

4.5 Coimbatore: The intercropping system of pearl millet + foxtail millet (27.13 q/ha) as well as sole crop of foxtail millet (17.68 q/ha) produced lesser PMEY than sole crop of pearl millet (33.96 q/ha). The highest PMEY was recorded in the sole barnyard treatment (54.90 q/ha) followed by sole proso millet (47.17 q/ha), sole mungbean (43.79 q/ha) and among intercropping systems it was highest in pearl millet + proso millet treatments (40.10 q/ha). The range of PMEY was between 37.83-39.32 q/ha among remaining treatments. The economic evaluation revealed that gross returns, net returns and BC ratio of Rs. 137312, Rs. 101330/ha and 3.82 were realized maximum in pearl millet + barnyard treatment followed by sole proso millet treatment with

respective values of Rs. 117968/ha, Rs. 81736/ha and 3.26, respectively. Among intercropping systems it was highest in pearl millet + proso millet treatments (100317/ha, Rs. 60855/ha and 2.54, respectively).

Zonal performance - Zone B

The mean data of three locations exhibited that the pearl millet grain yield was found highest in sole pearl millet (25.96 q/ha) as compared to different intercropping systems with pearl millet grain yield varying from 17.07-19.22 q/ha. However, the dry fodder yield was drastically reduced from 52.74 q/ha in sole pearl millet to 32.05-34.75 q/ha among different intercropping treatments. The grain yield among minor millets was highest in barnyard (15.10 q/ha) which was followed by proso millet millet (14.91 q/ha), little millet (12.47 q/ha), foxtail millet (11.55 q/ha) and minimum in mung bean (9.15 q/ha). The highest PMEY (31.74 q/ha) was recorded in the Pearl millet + Mungbean intercropping system treatment which was followed by sole barnyard treatment (31.34 q/ha) and pearl millet + proso millet treatments (30.77 q/ha) traetments. The range of PMEY was between 18.95-30.47 q/ha among remaining treatments whereas, it was 27.28 q/ha in the sole pearl millet crop. The economic evaluation study revealed that gross returns (Rs. 72051/ha) was maximum in pearl millet + mungbean treatment whereas net returns (Rs. 47415/ha) and BC ratio (3.00) in sole barnyard millet treatment. Among remaining intercropping systems, the net returns (Rs. 26645-35888/ha & B: C (2.67-2.80) were realized more than sole pearl millet crop (Rs. 24189/ha and 2.51, respectively). The net returns and B:C were achieved less in sole foxtail (Rs. 14977/ha and 2.11, respectively) and sole mungbean (Rs. 19497/ha and 2.21, respectively cultivation as compared to sole pearl millet.

PMAT 7: Productivity of pearl millet [*Pennisetum glaucum* (L.) R.Br. Emend. Stuntz]-Mustard/ Chickpea cropping sequence as influenced by organic and naturalfarming.

The field experiment aimed to evaluate the effect of organic and natural farming on productivity, quality, soil properties and microbial counts of pearl millet and mustard/chickpea crops was started during *Kharif*, 2022 at two locations of Zone A1 (Mandor and Bikaner), four locations in Zone A (Jaipur, Jamnagar, Jammu and Hisar) and five locations in Zone B (Aurangabad, Coimbatore, Vijyapur, Dhule and Peruvulam). The performance of most popular pearl millet hybrid or mustard/gram varieties of the locations in Zone A1, Zone A and Zone B were evaluated with nine different treatments *i.e.* T_1: Control (RDF), T_2: RDN* through Farm yard manure (FYM), T_3: RDN through Vermicompost (VC), T_4: DN through Poultry manure(PM) for Zone A &B / *Sheep or Goat manure for Zone A_1, T_5: DN through Poultry manure(PM) for Zone A &B / *Sheep or Goat manure for Zone A_1, T_6: RDN through Poultry manure(PM) for Zone A &B / *Sheep or Goat manure for Zone A_1, T_7: RDN through Poultry manure + Biofertilizer and T_8 : *** Cow based bio formulation (250 kg/ha Cow Urine Based Solid Organic bio-Formulation (CUBSOF)/ha before sowing along with sieved dry FYM @ 250 kg/ha will be applied into the soil before sowing and Cow Urine Based Liquid Organic bio-Formulation (CUBLOF) @ 500 litre/ha with irrigation water or foliar spray of 10 % will be applied two times at 15-20 & 35-40 DAS in pearl millet and after 35-40 & 70-75 DAS in mustard/chickpea crops during the crop season) and T_9: RDF** Nine treatments were replicated three times in RBD. Data on ancillary characters, nutritional aspects, microbial counts, yield attributes, yield and economics are presented in Table II.42 to II.86.

7.1 Bikaner: The data presented in the Tables II.42 to 45 during *kharif*, 2024 exhibited significantly higher pearl millet grain yield in RDF treatment (26.00 q/ha) than control (16.53 q/ha), FYM (18.03 q/ha), VC (18.67 q/ha), Goat Manure (18.67 q/ha) and FYM + Biofertilizer treatments (21.30 q/ha) but remained at par with cow based formulation and other treatments with range from 23.13-24.00 q/ha. Maximum stover yield was recorded by T_9- RDF (59.00 q/ha) treatment and it also followed the trend of grain yield. The stover yield was 49.63 q/ha in the cow based treatment and 37.30 q/ha in control. The gross returns (Rs. 66797/ha), net returns (Rs. 37797/ha) and BC ratio (2.3) were highest in the RDF treatment during *kharif*, 2023 season.

7.2 Mandor: The grain and and stover yields were found maximum in RDF treatment (19.37 q/ha grain; 35.17 q/ha stover) and these were higher by 81.5 and 95.4 %, respectively over the control. The grain and stover yields were significantly lower in the cow based treatment (13.00 q/ha grain; 23.50 q/ha stover) and sheep/goat manure sole treatments). The range of grain yield was between 13.90-16.63 q/ha and stover yield between 24.70-31.53 q/ha among the sole organic manures and their combination with biofertilizer treatments. The maximum gross (Rs. 73696/ha), net returns (Rs. 48196/ha) and BC ratio (2.9) were found in the RDF treatment and resulted in Rs. 20796/ha more net returns over the cow based treatment (T_8).

During Rabi 2023-24, maximum chickpea seed yield (25.80 q/ha) was recorded by RDF treatment which was significantly higher than all other RDN through sole organic manure and their combination treatments with biofertilizer and cow based bio formulation treatment (19.13 q/ha) however, it remained at par to RDN through Poultry + Biofertilizer treatment (23.00 q/ha). Maximum straw yield was recorded in RDF treatment (33.93 q/ha) which was significantly higher than all the treatments and it was 21.97 q/ha in control and 27.73 q/ha in cow based treatment. Similarly maximum gross returns (Rs. 170892/ha), net returns (Rs. 136392/ha) and BC ratio (5.58) were recorded by RDF treatment and this treatment resulted in Rs. 64385 and Rs. 41147/ha more net returns over control and cow based bio formulations treatment.

The enzymatic and microbial count studies after *kharif*, 2024 season of pearl millet (Tables 46-47) revealed that The dehydrogenase and alkaline phosphatase activity were recorded highest in the T5 treatment (RDN through FYM + biofertilizer) being statistically at par with T6 (RDN through VC + biofertilizer) but significantly superior over all other treatments. Acid phosphatase was found statistically at par in the T4 to T8 treatments but significantly higher than control and RDF treatments. Urease population was found statistically at par among T5 to T7 treatments but showed their statistical superiority than all the remaining treatments. The SMBC populations were recorded highest in treatment T5 and it was at par with T4, T6 and T7 treatments but significantly superior over all other treatments. The bacterial counts were recorded highest in treatment T5 and it was at par with T6 and T7 treatments but significantly superior than remaining treatments. Fungal counts was found significantly higher in the T7 treatment but statistically at par with T6 & T8 but shown its significant superiority than other treatments. The actinomycetes counts were found significantly higher in T6 (RDN through VC + biofertilizer) treatment than all other except T5 treatment.

The enzymatic and microbial count studies (Table 50-51) after *Rabi* 2023-24 season in chickpea revealed that all the enzymatic activities i.e. dehydrogenase activity (335.5-409.9 µg TPF g^{-1} soil), alkaline phosphatase (6.60-7.37 µg PNP g^{-1} soil), acid phosphatase (3.77-3.97 µg PNP g^{-1}

soil) and Urease activities in T5 to T7 treatments were significantly higher than all the treatments and values were 163.8 & 235.2 µg TPF g^{-1} soil, 5.43 & 5.87 µg PNP g^{-1}, 2.60 & 3.53 µg PNP g^{-1} soil, and 8.14 & 9.49 umol NH_3 g^{-1} soil, respectively in control and Cow based treatments. Bacterial count was recorded significantly higher in treatment T_5 (10.24 log^{10} cfu/g soil) than all treatments except T4, T6 & T7. The fungal counts (6.32 log^{10} cfu/g soil) and actinomycetes counts (8.46 log^{10} cfu/g soil) were recorded significantly higher in treatment T6 which remained at par with T4, T5,T7 & T8 treatmets . The SMBC ug/g soil were recorded significantly higher in T5 treatment than all the treatments except T3,T4, T6 & T7.

Zonal performance – Zone A1

The two locations mean data showed the superiority of treatment T_9 (RDF) treatment in terms of grain and stove yields (20.74 and 36.81 q/ha, respectively) compared to all the remaining treatments including control (13.26 q/ha grain; 25.94 q/ha stover) and cow based formulation treatment (17.50 q/ha grain; 34.04 q/ha stover). The grain and stover yields were improved by 56.4 and 60.5% in the T_9 treatment over the control and by 18.5 and 22.3 % over the cow based formulation treatment (T_8). The T_9 treatment resulted in Rs. 19437/ha and Rs. 11045/ha more net returns over the control and cow based treatments. The maximum B:C was also recorded in the T_9 (2.8) whereas it was 1.9 and 2.2 in control and cow based treatments.

The enzymatic and microbial count studies (Tables 50-51) after *Rabi* 2023-24 season in chickpea revealed that all the enzymatic activities i.e. dehydrogenase activity (335.5-409.9 µg TPF g^{-1} soil), alkaline phosphatase (6.60-7.37 µg PNP g^{-1} soil), acid phosphatase (3.77-3.97 µg PNP g^{-1} soil) and Urease activities in T5 to T7 treatments were significantly higher than all the treatments Bacterial count was recorded significantly higher in treatment T_5 (10.24 log^{10} cfu/g soil) than all treatments except T4, T6 & T7. The fungal counts (6.32 log^{10} cfu/g soil) and actinomycetes counts (8.46 log^{10} cfu/g soil) were recorded significantly higher in treatment T6 which remained at par with T4, T5, T7 & T8 treatmets . The SMBC ug/g soil were recorded significantly higher in T5 treatment than all the treatments except T3,T4, T6 & T7.

The enzymatic and microbial count studies after *kharif, 2024* season of pearl millet (Tables 46-47) revealed that the dehydrogenase and alkaline phosphatase activity were recorded highest in the treatment T5 (RDN through FYM + biofertilizer). Acid phosphatase was found statistically at par among T4 to T8 treatments but significantly higher than control and RDF treatments. Urease population was found statistically at par among T5 to T7 treatments but showed their statistical superiority than all the remaining treatments. The SMBC was recorded highest in treatment T5 and it was at par with T4, T6 and T7 treatments but significantly superior over all other treatments. The bacterial counts were recorded highest in treatment T5 and it was at par with T6 and T7 treatments but significantly superior than remaining treatments. Fungal counts was found significantly higher in the T7 treatment but statistically at par with T6 & T8 but shown its significant superiority than other treatments. The actinomycetes counts were found significantly higher in T6 (RDN through VC + biofertilizer) treatment than all other except T5 treatment.

7.3 Hisar: Results shown in Table II.52-53 exhibited that organic and cow centric nutrients have significant impact on grain and stover yield of pearl millet. The grain and stover yield of pearl millet showed an increment with the application of different organic manures alone (*viz.*, farmyard manure (FYM), vermicompost (VM) and poultry manure (PM) and in combination

with bio fertilizers over control. Highest grain and straw yield (39.15 q/ha in grain and 107.95 q/ha in stover) were obtained under treatment RDF. However, lowest grain and straw yields (22.14 q/ha and 62.43 q/ha) were obtained in the control. The respective range of grain yield was in the range of 31.40 to 34.57 q/ha and 88.49-101.17 q/ha, respectively in the T_2 to T_7 treatments whereas, it was 26.62 q/ha and 74.83 q/ha, respectively in cow based treatment (T_8). Highest gross (Rs. 124367/ha), net returns (Rs. 76994/ha) and BC ratio (2.28) were also found in the T_9 treatment and resulted in Rs. 40847/ha more net returns over the cow based treatment (T_8).

During 2023-24, in comparison to significantly higher mustard seed yield in the RDF treatment (13.52 q/ha), the respective yield in the control was 5.45 q/ha whereas, in cow based formulation treatment it was 6.25 q/ha. The range of seed yield in the sole organic manure treatments i.e. FYM, VC and Poultry Manure was between 7.54–7.84 q/ha whereas, the combination of these organic manures with biofertilizer it varied between 8.14-8.62 q/ha. Similar trend was also observed for seed yield attributes viz. Seeds/siliqua, no. of siliquae/plant and number of siliquae/plant. The test weight was found significantly higher in RDF treatment (5.6%) than all the treatments of cow based, sole application of FYM,VC and Poultry Manure and control whereas, it remained statistically at par with FYM,VC and Poultry Manure plus biofertilizers treatments (T_5 to T_7). The oil content was found statistically at par among different treatments.

It can be inferred from the Table II.56-57 that organic sources of nutrients alone as well as along with biofertilizers were found to be higher in SOC, available nitrogen (N), phosphorus (P) and potash (K). Maximum available soil organic carbon (0.42 %) and N (195.3 kg/ha) were observed in the FYM along with biofertilizers treatment. However, organic carbon and available nitrogen (N) in post-harvest soils were observed minimum under control followed by cow based formulation treatment.

An appraisal of data presented in Table II.60 inferred that remarkable effects of biofertilizers, FYM and vermicompost were observed on the bacterial population of soil after harvesting of pearl millet. Treatments RDN through FYM + Biofertilizer (5.82×10^7 cfu count g^{-1} soil) and RDN through VC+ Biofertilizer (5.75×10^7 cfu count g^{-1} soil)treatments notably recorded significantly higher bacterial population over cow based bio formulations (5.25×10^7 cfu count g^{-1} soil), control (4.10×10^5 cfu count g^{-1} soil) and RDF treatment (4.95×10^5cfu count g^{-1} soil). The fungal population was found maximum in RDN through PM + Biofertilizer (7.47×10^5 cfu count g^{-1} soil) followed by RDN through VC + Biofertilizer (7.12×10^5 cfu count g^{-1} soil) treatments and shown their significantly superiority than the cow based treatment (4.50×10^5 cfu count g^{-1} soil), control (2.80×10^5 cfu count g^{-1} soil) and RDF treatment (3.53×10^5 cfu count g^{-1} soil). The actinomycetes population was found significantly higher among all the organic manure alone, organic manure+biofertilizer and cow based treatments as compared to control and RDF alone treatments. However, the treatment RDN through VC + Biofertilizer (16.52×10^5 cfu count g^{-1} soil) showed its significant superiority than all the treatments with value of 13.98×10^5 cfu count g^{-1} soil in cow based treatment over control (10.83×10^4 cfu count g^{-1} soil) and RDF treatment (11.85×10^5 cfu count g^{-1} soil).

7.4 Jaipur: The data presented in the Tables II.52 to55 exhibited at par performance for grain yield in the treatments T4, T6, T7,T8 & T9 (24.57 to 26.60 q/ha) and all these produced significantly higher yield than control (19.88 q/ha) and FYM alone (20.39 q/ha). The stover yield

(51.03-56.14 q/ha) was statistically at par among T3 to T9 treatments but significantly superior over control (45.19 q/ha). The respective grain and stover yields were 25.55 q/ha and 55.87 q/ha, respectively in the cow based treatment. The protein content was found statistically at par among all the treatments.

During *Rabi* 2023-24, the perusal of the data in Tables 61 to 65 revealed that the mustard seed yield was found in the range of 11.76-12.56 q/ha in the treatments T_3 to T_7 and remained statistically at par but significantly superior over control (8.55 q/ha) and cow based treatment (10.29 q/ha). Similar trend was also observed for mustard straw yield.

7.5 Jamnagar: The study exhibited that the grain yield was significantly higher in the RDF treatment (24.39 q/ha) over all the treatments except T5 (20.18 q/ha), T7 (22.63 q/ha) & T8 (20.38 q/ha). The grain yield was higher by 124.8 and 19.7 per cent higher over control and cow based treatments. The stover yield was significantly higher in RDF treatment as compared to all the treatments and it was 91.7 and 18.8 per cent more in these treatments, respectively. Among organic manure treatments, the poultry manure application alone (18.16 q/ha) and in combination (22.63 q/ha) resulted into higher yield as compared to sole FYM, vermicompost and their combinations with biofertilizer treatments. The protein content in T7 & T8 treatments was significantly higher than all the treatments. The highest gross returns (Rs. 76994/ha), net returns (Rs. 53717/ha) and BC ratio (3.31) were found in the RDF treatment and resulted in Rs. 13723/ha more net returns over the cow based treatment (T_8).

Table II.56-57 exhibited that organic sources of nutrients alone as well as along with biofertilizers were found to be higher in SOC (0.63-0.72%) than 0.63% in cow based treatment and 0.45 % in RDF treatment. The available nitrogen in the RDF (220.2 kg/ha), Poultry Manure (205.6 kg/ha) and VC (202.0 kg/ha) along with biofertilizer treatments, significantly higher than all the treatment and it was 199.1 kg/ha in cow based treatment and 182.5 kg/ha in control. The available phosphorus (25.4-28.3 kg/ha) in the treatments T4 to T9 was statistically at par but significantly superior than control (17.5 kg/ha) The available potash (311.7-324.1 kg/ha) in the treatments from T3 to T9 was at par but shown their significant superiority over control (291.6 kg/ha). During 2022, bacterial counts were observed significantly higher in T_8 than all the treatments except FYM alone and FYM along with biofertilizer treatments which remained statistically at par. The microbial counts study was not reported during 2023 & 2024 crop seasons.

Maximum mustard seed yield was recorded in the RDF treatment (15.57 q/ha) whereas, the respective yield in the control was 4.65 q/ha whereas, in cow based formulation treatment it was 6.65 q/ha. The range of seed yield in the sole organic manure treatments i.e FYM, VC and PM was between 5.62-7.49 q/ha whereas, the combination of these organic manures with biofertilizer it varied between 8.27-11.77 q/ha. Simiilar trend was also observed for seed yield attributes viz. Seeds/siliqua, no. of siliquae/plant and number of siliquae/plant. The oil content was 33.0% in the RDF treatment whereas, it was 27.2% in the control and 28.2% in the cow based formulation treatment during 2022-23 season. The highest gross returns (Rs. 94635/ha) and net returns (Rs. 65936/ha) and BC ratio (3.3) were found highest in the RDF treatment and resulted in Rs. 44343/ha more net returns over the cow based treatment (T_8).

After mustard harvest, the OC was between 0.61-0.70 % among organic manure treatments in comparison to 0.62 % in cow based treatment, 0.44 % in RDF and 0.47 % in control. The available N was significantly highest in RDF treatment (225.0 kg/ha) as compared to all the treatments from T2 to T7 (193.3-204.8 kg/ha), control (181.4 kg/ha) and cow based treatment (198.8 kg/ha). The available P was statistically at par between T4 to T9 treatments but significantly superior over control. The available K was found statistically at par between T3 to T9 treatments and cow based bio formulation treatment (316.9 kg/ha) showed higher value than control (287.3 kg/ha).

7.6 Jammu: During 2024**,** the data presented in the Table II.52 to 55 exhibited that grain yield was significantly higher in the RDF treatment (29.397 q/ha) as compared to all the treatments (18.99-24.07 q/ha) except RDN through Poultry Manure + Biofertilizer treatment (25.66 q/ha). The stover yield was found statistically at par in the RDF and RDN through Poultry Manure + Biofertilizer treatment and former had shown its significant superiority among remaining treatments including control. The grain (29.97 q/ha) and stover (51.77 q/ha) yields were significantly higher in the RDF treatment over all the treatments. The grain yield was higher by 51.4 and 36.8 per cent higher over control and cow based treatments.

Zonal performance – Zone A

The four locations mean data showed the superiority of T_9 (RDF) treatment in terms of grain and stover yield (31.32 and 63.86 q/ha, respectively) compared to all the remaining treatments including control (18.85 q/ha grain; 41.76 q/ha stover). The grain and stover yields were higher by 66.2 and 52.9 % in the T_9 treatment over the control and by 31.1 and 23.5% than the cow based formulation treatment (T_8). Among organic manures, the treatment T7 (RDN through Poultry Manure+ Biofertilizer) produced maximum grain yield (27.93 q/ha) and stover yield (58.94 q/ha) and was comparable to RDF treatment. The T_9 treatment resulted in Rs. 39765/ha and Rs. 28052/ha more net returns over the control and cow based treatments. The maximum B:C was also recorded in the T_9 (2.52) whereas it was 1.59 and 1.88 in control and cow based treatments. The protein content was observed maximum in the Poultry manure (10.2%) treatment as compared to 9.5% in RDF and 10.1 % in cow based treatments whereas, lowest in the control (9.1%).

At Hisar, it can be inferred from the Table II.56-57 that organic sources of nutrients alone as well as along with biofertilizers were found to be higher in SOC, available nitrogen (N), phosphorus (P) and potash (K). Maximum available soil organic carbon (0.42 %) and N (195.3 kg/ha) were observed in the FYM along with biofertilizers treatment. However, organic carbon and available nitrogen (N) in post-harvest soils were observed minimum under control followed by cow based formulation treatment.

An appraisal of data presented in Table II.60 at Hisar centre inferred that remarkable effects of biofertilizers, FYM and vermicompost were observed on the bacterial population of soil after harvesting of pearl millet. Treatments RDN through FYM + Biofertilizer (5.82×10^7 cfu count g-¹ soil) and RDN through VC+ Biofertilizer (5.75×10^7 cfu count g-¹ soil) treatments notably recorded significantly higher bacterial population over cow based bio formulations (5.25×10^7 cfu count g-¹ soil), control (4.10×10^5 cfu count g^{-1} soil) and RDF treatment (4.95×10^5cfu count g-¹ soil). The fungal population was found maximum in RDN through PM + Biofertilizer (7.47 ×

10^5 cfu count g^{-1} soil) followed by RDN through VC + Biofertilizer (7.12×10^5 cfu count g^{-1} soil) treatments and shown their significant superiority than the cow based treatment (4.50×10^5 cfu count g-¹ soil), control (2.80×10^5 cfu count g-¹ soil) and RDF treatment (3.53×10^5 cfu count g-¹ soil). The actinomycetes population was found significantly higher among all the organic manure alone, organic manure +biofertilizer and cow based treatments as compared to control and RDF alone. However, the treatment RDN through VC + Biofertilizer (16.52×10^5 cfu count g-¹ soil) showed its significant superiority than all the treatments with value of 13.98×10^5 cfu count g-¹ soil in cow based treatment, control (10.83×10^5 cfu count g-¹ soil) and RDF treatment (11.85×10^5 cfu count g-¹ soil).

At Jamnagar, Table II.56-57 exhibited that organic sources of nutrients alone as well as along with biofertilizers were found to be higher in SOC (0.63-0.72%) than 0.63% in cow based treatment and 0.45 % in RDF treatment. The available nitrogen in the RDF (220.2 kg/ha), Poultry Manure (205.6 kg/ha) and VC (202.0 kg/ha) along with biofertilizer treatments, significantly higher than all the treatment and it was 199.1 kg/ha in cow based treatment and 182.5 kg/ha in control. The available phosphorus (25.4-28.3 kg/ha) in the treatments T4 to T9 was statistically at par but significantly superior than control (17.5 kg/ha) The available potash (311.7-324.1 kg/ha) in the treatments from T3 to T9 was at par but shown their significant superiority over control (291.6 kg/ha). During 2022, bacterial counts were observed significantly higher in T_8 than all the treatments except FYM alone and FYM along with biofertilizer treatments which remained statistically at par. The microbial counts study was not reported during 2023 & 2024 crop seasons.

The three locations mean data showed the superiority of treatment T_9 (RDF) treatment in terms of seed and straw yield of mustard (14.15 and 33.74 q/ha, respectively) compared to all the remaining treatments including control (6.40 q/ha seed; 19.30 q/ha straw). The seed and straw yield were higher by 121.1 and 74.8 % in the T_9 treatment over the control and by 70.7 and 39.2% over the cow based formulation treatment (T_8).

At Jamnagar, after mustard harvest, the OC was between 0.61-0.70 % among organic manure treatments in comparison to 0.62 % in cow based treatment, 0.44 % in RDF and 0.47 % in control. The available N was significantly highest in RDF treatment (225.0 kg/ha) as compared to all the treatments from T2 to T7 (193.3-204.8 kg/ha), control (181.4 kg/ha) and cowbased treatment (198.8 kg/ha). The available P was statistically at par between T4 to T9 treatments but significantly superior over control. The available K was found statistically at par between T3 to T9 treatments and cow based bio formulation treatment (316.9 kg/ha) showed higher value than to control (287.3 kg/ha).

7.7 Aurangabad: The data presented in the Tables II.67 to 73 exhibited at par performance for grain yield in the treatments T_5 to T_7 (22.00-23.40 q/ha) and all these were statistically at par with cow based formulation (19.20 q/ha) and control (14.10 q/ha). The stover yield also followed the trend of grain yield. The grain yield (26.30 q/ha) was significantly higher in the RDF treatment than cow based treatment (19.2 q/ha). The stover yield (57.41 q/ha) was significantly higher in the RDF treatment than all the treatments. The grain yield was higher by 86.5 and 36.9 per cent higher over control and cow based treatments, respectively. The T_9 treatment resulted in Rs. 37721/ha and Rs. 22799/ha more net returns over the control and cow based treatments. The

maximum B:C was also recorded in the T_9 (2.87) whereas, it was 1.74 and 2.19 % in control and cow based treatments, respectively.

7.8 Dhule: The grain and and stover yields were found maximum in T_9 treatment (26.21 q/ha grain; 48.02 q/ha stover) and grain yield was higher by 79.2 and 39.0 % over the control and cow based treatment, respectively. The grain and stover yield were significantly lower in the cow based treatments (T_8) treatment (18.85 q/ha grain; 34.54 q/ha stover) as compared to RDF treatment but remained at par with the sole organic manure treatments (FYM, VC and Poultry Manure) but significantly lesser grain yield than their combination with biofertilizers treatments. The maximum gross (Rs. 69374/ha), net returns (Rs. 41337/ha) and BC ratio (2.47) were found in the T_9 treatment and resulted in Rs. 18837/ha more net returns over the cow based treatment (T_8).

The perusal of the data during 2022 season in Table II.48 revealed that organic sources of nutrients alone as well as along with biofertilizers were found to be higher in SOC , available nitrogen (N), phosphorus (P) and potash (K). Maximum available soil organic carbon (0.58 %), N (213.7 kg/ha) and P_2O_5 (17.2 kg/ha) were observed in the FYM along with biofertilizer treatment. However, organic carbon and available nitrogen (N) in post-harvest soils were observed minimum under control followed by RDF treatment.

During Rabi 2023-24 season, maximum chickpea seed yield (16.18 q/ha) was recorded by RDF treatment which was significantly higher than all other organic treatments (9.51-14.43 q/ha) and cow based bio formulation treatment (9.34 q/ha seed). Maximum straw yield was recorded in RDF treatment (28.07 q/ha) which was significantly higher than control (13.71 q/ha) and sole application of FYM, VC, poultry manure as well as in combination with biofertilizer treatments (16.50-25.04 q/ha) and cow based bio formulation treatment (16.20 q/ha seed). Similarly maximum gross returns (Rs. 144152/ha), net returns (Rs. 94249/ha) and BC ratio (2.89) were recorded by RDF treatment and this treatment resulted in Rs. 61601 and Rs. 48048/ha more net returns over control and cow based bio formulation treatments.

7.9 Vijayapur: All the yield attributes (total no. of tillers, effective tillers, ear head length, ear head girth and 1000 grains weight) grain and stover yields were significantly increased with the application of different sole organic manures (farmyard manure, vermicompost and poultry manure) and also along with biofertilizers over control (Tables II.67-82). Highest grain yield (24.59 q/ha) was obtained under vermicompost + biofertilizers treatment whereas, stover yield was found statistically at par among all the treatments (T2 to T9) but significantly higher over control (T1). However, lowest grain and straw yields (14.38 & 43.71 q/ha) were obtained in the control. The respective range of grain yield was in the range of 20.16 to 24.59 q/ha and 51.76 to 54.07 q/ha, respectively in the T_5 to T_7 treatments whereas, it was 19.84 q/ha and 48.98 q/ha, respectively in cow based treatment (T_8). The Fe and Zn content in pearl millet grain were found statistically at par among all the treatments as compared to control.

The SOC (%) was statistically at par in cow based (0.64%) and RDF (0.62%) over the control (0.63%) but significantly higher in the sole organic manures and their combination with biofertilizer treatments (0.68-0.70%). Maximum available N (218.4 kg/ha), P (25.2 kg/ha) and K (425.5 kg/ha) were observed in the vermicompost along with biofertilizer treatment. The data

presented in Table II.78 inferred that cow based formulation, organic manures (FYM, PM and vermicompost) and organic manures with biofertilizers showed significantly higher bacterial population (59.00 to 73.67 10^6 cfu count g^{-1} soil in soil) over control and RDF treatments after harvesting of pearl millet. However, treatment receiving cow based bio formulations notably recorded bacterial population (65.33 × 10^6 cfu count g^{-1} soil) over control (34.00 × 10^6 cfu count g^{-1} soil) and RDF (43.33 × 10^6 cfu count g^{-1} soil).

In chickpea crop during 2023-24, the seed yield was 10.82 q/ha in control whereas, it was 13.13 q/ha in cow based bio formulation treatment. Maximum yield was realized in RDN through vermicompost + biofertilizers treatment (15.11 q/ha). The seed yield was 14.04 q/ha in RDF treatment. Similar trend was observed during 2023-24 crop season also. The straw yield was not statistically improved by organic manures, their combination with biofertilizers, cow based formulation and RDF treatments over the control. Seed index, protein content and no. of seeds/pod were found statistically at par among different treatments. However, number of primary branches, secondary branches and number of pods/plant were significantly superior among all the applied input treatments over the control.

2.10 Coimbatore: The study exhibited that the grain yield was significantly higher in the RDF (27.43 q/ha) over all the treatments (19.24-22.61 q/ha) except cow based treatment (24.39 q/ha). The stover yield also followed the trend of grain yield. Among sole organic manure treatments and along with biofertilizers, the grain and stover yields were at par among themselves as well as in comparison to cow based treatment. The highest gross returns (Rs. 109167/ha), net returns (Rs. 70267/ha) and BC ratio (2.81) were found in the RDF treatment and resulted in Rs. 10051/ha more net returns over the cow based treatment (T_8).

During Rabi 2023-24 season, maximum chickpea seed yield (14.08 q/ha) was recorded by RDF treatment which was significantly higher than all other organic treatments except cow based bio formulation treatment (12.91 q/ha seed). Maximum straw yield was recorded in RDF treatment (17.05 q/ha) which was significantly higher than control (10.72 q/ha) and sole application of FYM, VC, goat manure as well as in combination treatments (13.18-14.29 q/ha). Similarly maximum gross returns (Rs. 114113/ha), net returns (Rs. 73791/ha) and BC ratio (2.44) were recorded by RDF treatment and this treatment resulted in Rs. 44874 and Rs. 6602/ha more net returns over control and cow based bio formulation treatments.

After pearl millet- chickpea crop rotation during *Rabi* 2023-24 (Tables 83-84), the soil study revealed that the soil OC was found statistically at par among organic manures and cow based treatments (0.43-0.44%) and shown their significant superiority over control and RDF with 0.41% OC. The available N was significantly higher in RDF treatment as compared to all the treatments except T6, T7 and cow based treatments. The available P was statistically at par among T2 to T9 treatments and exhibited their statistical superiority over the control. The available K was found statistically at par among T5 to T9 treatments but cow based and RDF treatments shown their significant superiority over T1 to T4 treatments.

2.11 Perruvullam: The data presented in the Table II.67 to 82 exhibited at par performance for grain yield in the treatments T_2 to T_7 treatments (23.19-27.82 q/ha) and all these produced statistically higher yield than cow based formulation (14.39 q/ha) and control (13.40 q/ha). The

stover yield was found statistically at par among RDF and T_4 to T_7 treatments but RDF treatment produced significantly higher over control, sole application of FYM, VC and cow based treatments. The highest gross returns (Rs. 109106/ha) and net returns (Rs. 67606/ha) and BC ratio (2.62) were found in the T_9 treatment and resulted in Rs. 57343/ha and Rs.46547/ha more net returns over the control (T1) and cow based treatments (T_8).

The pH, EC and SOC (%) were not significantly affected by cow based, RDF, organic sources of nutrients alone as well as along with biofertilizers over the control. Maximum available N (263.3 kg/ha) was in the RDF treatment which was followed by RDN through VC treatment (254.7 kg/ha) and all the treatments had significantly more available N than control. Highest available P (58.3 kg/ha) was observed in the cow based treatment but statistically at par with T6, T& and T9 treatments and all these were statistically superior than rest of the treatments. The available K was significantly higher in the sole application of VC treatment as compared to all the treatments. An appraisal of data presented in Table II.78 inferred that cow based bio formulations and RDN through Vermicompost + biofertilizer notably recorded highest bacterial population (12.33 $\times 10^6$ cfu count g^{-1} soil) over control (7.67$\times 10^6$ cfu count g^{-1} soil) and RDF treatment (8.67$\times 10^6$ cfu count g-¹ soil). However, the fungal population was found maximum in RDN through Vermicompost + biofertilizer treatment (8.00 $\times$ 10^4 cfu count g^{-1} soil) as compared to cow based treatment (6.67$\times 10^4$ cfu count g-¹ soil), control (3.67$\times 10^4$ cfu count g^{-1} soil) and RDF treatment (4.33$\times 10^4$ cfu count g^{-1} soil).

During Rabi 2023-24 season, chickpea seed yield was not significantly improved by any of the treatments as compared to control.

Zonal performance – Zone B

The mean data of the five locations for grain and stover yield revealed the superiority of RDF treatment T_9 (27.04 and 49.69 q/ha, respectively) compared to all the remaining treatments including control (15.09 q/ha grain; 31.74 q/ha stover). The grain and stover yields were higher by 79.2 and 26.6% in the T_9 treatment over the control and by 34.5 and 24.2% over the cow based formulation treatment (20.11 q/ha grain; 40.02 q/ha stover). The T_9 treatment resulted in Rs. 34647/ha and Rs. 22344/ha more net returns over the control and cow based treatments. The maximum B:C was also recorded in the T_9 (2.67) whereas it was 1.73 and 2.03 in control and cow based treatments.

At Vijyapur, the SOC (%) was statistically at par in cow based (0.64%) and RDF (0.62%) over the control (0.63%) but significantly higher in the sole organic manures and their combination with biofertilizer treatments (0.68-0.70%). Maximum available N (218.4 kg/ha), P (25.2 kg/ha) and K (425.5 kg/ha) were observed in the vermicompost along with biofertilizer treatment. The data presented in Table II.78 inferred that cow based formulations, organic manures (FYM, PM and vermicompost) and organic manures with biofertilizers showed significantly higher bacterial population (59.00 to 73.67 10^6 cfu count g^{-1} soil in soil) over control and RDF treatments after harvesting of pearl millet. However, treatment receiving cow based bio formulations notably recorded bacterial population (65.33 $\times$ 10^6 cfu count g^{-1} soil) over control (34.00 $\times$ 10^6 cfu count g^{-1} soil) and RDF treatment (43.33 $\times$ 10^6 cfu count g^{-1} soil).

The four locations mean data showed the superiority of treatment T_9 (RDF) treatment in terms of seed and straw yield of chickpea (16.46 and 22.24 q/ha, respectively) compared to all the remaining treatments including control (10.09 q/ha seed; 13.29 q/ha straw). The seed and straw yields were higher by 63.1 and 67.3% in the T_9 treatment over the control and by 23.1 and 30.9% over the cow based formulation treatment (T_8). Maximum gross returns (Rs. 120195/ha), net returns (Rs. 75582/ha) and BC ratio (2.66) were recorded by RDF treatment and this treatment resulted in Rs. 46667 and Rs. 27285/ha more net returns over control and cow based bio formulations treatment.

At Coimbatore, after pearl millet- chickpea crop rotation during 2023-24, the soil study revealed that the soil OC was found statistically at par among organic manures and cow based treatments (0.43-0.44%) and shown their significant superiority over control and RDF with 0.41% OC. The available N was significantly higher in RDF treatment as compared to all the treatments except T6, T7 and cow based treatments. The available P was statistically at par among T2 to T9 treatments and exhibited their statistical superiority over the control. The available K was found statistically at par among T5 to T9 treatments but cow based and RDF treatments shown their significant superiority over T1 to T4 treatments.

At Perrumalai, the pH, EC and SOC (%) were not significantly affected by cow based, RDF, organic sources of nutrients alone as well as along with biofertilizers over the control. Maximum available N (263.3 kg/ha) was in the RDF treatment which was followed by RDN through VC treatment (254.7 kg/ha) and all the treatments had significantly more available N than control. Highest available P (58.3 kg/ha) was observed in the cow based treatment but statistically at par with T6, T& and T9 treatments and all these were statistically superior than rest of the treatments. The available K was significantly higher in the sole application of VC treatment as compared to all the treatments. An appraisal of data presented in Table II.78 inferred that cow based bio formulations and RDN through Vermicompost + biofertilizer notably recorded highest bacterial population (12.33×10^6 cfu count g^{-1} soil) over control (7.67×10^6 cfu count g^{-1} soil) and RDF treatment (8.67×10^6 cfu count g^{-1} soil). However, the fungal population was found maximum in RDN through Vermicompost + biofertilizer treatment (8.00×10^4 cfu count g^{-1} soil) as compared to cow based treatment (6.67×10^4 cfu count g^{-1} soil), control (3.67×10^4 cfu count g^{-1} soil) and RDF treatment (4.33×10^4 cfu count g^{-1} soil).

Table II.1: Summary of Agronomical trials conducted during 2024

S. No.	Name of centre	1			2	3	4	5	Trials allotted	Result reported	Trial failed/not conducted
		a	b	c							
ZONE A1											
1	Mandor	A	-	-	A	A	A*	A	5	4	PMAT 4 data not reported
2	Bikaner	A	-	-	A	A	A*	A*	4	4	PMAT 4 data and *PMAT 5 Rabi season 2023-24 data not reported
ZONE A											
3	Jaipur	-	A	-	A	A	A*	A	5	4	PMAT 4 data not reported
4	New Delhi	-	A	-	-	-	-	-	1	1	-
5	Hisar	-	A	-	A	A	A	A	5	5	-
6	Jamnagar	-	A	-	A	A	A	A	5	5	-
7	Jammu	-	-	-	-	-	-	A	1	1	
ZONE B											
7	Aurangabad	-	-	A	A	A	A	A	5	5	-
8	Dhule	-	-	A	A	A	A*	A	5	4	PMAT 4 data not reported
9	Vijayapur	-	-	A	A	A	A	A	5	5	-
10	Coimbatore	-	-	A	A	A	A	A	5	5	
11	Perumallapalle	-	-	-	-	-	-	A	1	1	-
	Total	**2**	**4**	**4**	**9**	**9**	**9**	**11**	**48**	**44**	

A= Alloted

Table II.2: Experimental details of Agronomy trials– *Kharif* 2024

Trials & Locations	Soil Status						Previous Crop	Variety Used	Nutrient (Kg/ha)			Date of operations carried							
	Type	pH	N	P	K	Depth/ Fe status			N	P	K	Sowing	Thinning	Top dresing	Weeding	Hoeing	Irri.	Pl. Prot.	Harvest
PMAT 1a																			
Bikaner	LS	7.7	L	L	M	Deep	Fallow	APT	APT	40	-	11/07/24	25/07/24	22/08/24	19/08/24 03/09/24	19/08/24 03/09/24	3	-	17/10/24
Mandor	SL	8.1	L	M	H	Deep	Pearl Millet	APT	APT	20	-	05/07/24	21/07/24	04/08/24	03/08/24 02/09/24	03/08/24 02/09/24	-	-	10/10/24
PMAT 1b																			
Jaipur	LS	7.6	L	M	M	Deep	-	APT	APT	30	-	11/07/24	27/07/24	01/08/24	25/07/24	25/07/24	-	-	11/10/24
Jamnagar	CL	7.4	M	L	M	60 cm	Groundnut	APT	APT	40	-	26/07/24	07/08/24	13/08/24	07/08/24 06/09/24	12/08/24 21/09/24	1	-	26/10/24
New Delhi	SL	7.8	201 kg/ha	16.3 kg/ha	221 kg/ha	Deep	Mustard	APT	APT	-	-	11/07/24	19/07/24	-	07/08/24 06/09/24	12/08/24 21/09/24	-	-	12/10/24
Hisar	SL	7.7	147.18 kg/ha	17.9 kg/ha	190 kg/ha	Deep	Fallow	APT	APT	62.5	-	13/07/24	31/07/24	07/08/24	4/8/24 21/8/24	4/8/24 21/8/24	-	-	12/10/24
PMAT 1c																			
Aurangabad	MDB	8.3	L	M	H	60 cm	Fallow	APT	APT	30	30	26/07/24	20/08/24	31/07/24	10/09/24	10/09/24	-	27/08/24	31/10/24
Dhule	MB	8.2	L	M	H	60-90 cm	Fallow	APT	APT	30	-	29/07/24	14/08/24	27/08/24	17/08/24 09/09/24	15/08/24 01/09/24	-	-	11/11/24
Vijayapur	MB	8.4	L	L	H	30-45 cm	Fallow	APT	APT	30	-	23/07/24	27/07/24	21/08/24	20/08/24	20/08/24	1	-	29/10/24
Coimbatore	CL	8.3	L	M	H	Deep	Fallow	APT	APT	40	40	09/08/24	21/08/24	26/08/24 12/09/24	24/08/24 09/09/24	24/08/24 09/09/24	5	-	25/11/24
PMAT 2																			
Bikaner	LS	7.7	L	L	M	Deep	Fallow	HHB 299	40	40	-	07/07/24	29/07/24	13/08/24 31/08/24	23/08/24 03/09/24	23/08/24 03/09/24	3	-	16/10/24
Mandor	SL	8.2	L	M	H	Deep	Pearl Millet	HHB 299	40	20	-	09/07/24	27/07/24	APT	06/08/24 19/08/24	06/08/24 19/08/24	-	-	0710/24
Jaipur	LS	7.6	L	M	M	Deep	-	RHB 233	60	30	-	11/07/24	27/07/24	APT	25/07/24	26/07/24	-	-	14/10/24

Table II.2: Experimental details of Agronomy trials– *Kharif* 2024

Trials & Locations	Soil Status						Previous Crop	Variety Used	Nutrient (Kg/ha)			Date of operations carried							
	Type	pH	N	P	K	Depth/ Fe status			N	P	K	Sowing	Thinning	Top dresing	Weeding	Hoeing	Irri.	Pl. Prot.	Harvest
Jamnagar	CL	7.5	L	M	H	60 cm	Groundnut	GHB 1231	80	40	-	26/07/24	07/08/24	13/08/24	07/08/24 06/09/24	12/08/24 21/09/24	1	-	29/10/24
Hisar	SL	7.7	147 kg/ha	20.1 kg/ha	178 kg/ha	Deep	Fallow	HHB 299	APT	APT	-	30/07/24	19/08/24	28/8/24 31/8/24	14/8/24 22/8/24	14/8/24 22/8/24	-	-	14/10/24
Aurangabad	MDB	8.3	L	M	H	60 cm	Fallow	AHB 1200	APT	APT	-	01/07/24	08/07/24	31/07/24	10/09/24	10/09/24	-	27/08/24	31/10/24
Dhule	MB	8.2	L	M	H	60-90 cm	Fallow	APT	60	30	-	06/07/24	21/07/24	08/08/24	29/07/24 30/07/24	29/07/24 30/07/24	-	-	06/10/24
Vijayapur	MB	8.2	L	L	H	30-45 cm	Fallow	VMPH 14	60	30	-	09/07/24	25/07/24	APT	25/07/24 23/08/24	25/07/24 23/08/24	1	-	14/10/24
Coimbatore	CL	8.5	L	M	H	Deep	Fallow	COH 10	80	40	40	10/08/24	20/08/24	APT	23/08/24 12/09/24	23/08/24 12/09/24	5	-	23/11/24
PMAT 3																			
Bikaner	LS	7.7	L	L	M	Deep	Fallow	HHB 299	40	40	-	07/07/24	29/07/24	13/08/24 31/08/24	23/08/24 03/09/24	23/08/24 03/09/24	3	23/07/24	16/10/24
Mandor	SL	8.2	L	M	H	Deep	Pearl Millet	HHB 299	40	20	-	05/07/24	27/07/24	APT	02/08/24 15/08/24	02/08/24 15/08/24	-	-	09/10/24
Jaipur	LS	7.6	L	M	M	Deep	-	RHB 233	APT	APT	-	15/07/24	14/08/24	APT	08/08/24	08/08/24	-	-	17/10/24
Hisar	SL	7.8	149 kg/ha	18.8 kg/ha	188 kg/ha	Deep	Fallow	HHB 299	APT	APT	-	13/07/24	31/07/24	07/8/24 20/08/24	4/8/24 21/8/24	4/8/24 21/8/24	-	-	12/10/24
Jamnagar	CL	7.5	L	M	H	60 cm	Groundnut	GHB 1231	80	40	-	26/07/24	07/08/24	13/08/24	07/08/24 06/09/24	12/08/24 21/09/24	1	-	29/10/24
Aurangabad	MDB	8.2	L	M	H	60 cm	Fallow	AHB 1200	APT	APT	30	02/07/24	10/07/24	30/07/24	13/08/24	13/08/24	-	-	05/10/24
Dhule	MB	8.2	L	M	H	60-90 cm	Fallow	AHB 1200	APT	APT	-	06/07/24	21/07/24	08/08/24	29/07/24 30/07/24	29/07/24 30/07/24	-	-	06/10/24
Vijayapur	MB	8.2	L	L	H	30-45 cm	Fallow	VPMH 14	60	30	-	09/07/24	26/07/24	APT	26/07/24 24/08/24	26/07/24 24/08/24	1	-	15/10/24

Table II.2: Experimental details of Agronomy trials– *Kharif* 2024

Trials & Locations	Soil Status						Previous Crop	Variety Used	Nutrient (Kg/ha)			Date of operations carried							
	Type	pH	N	P	K	Depth/ Fe status			N	P	K	Sowing	Thinning	Top dresing	Weeding	Hoeing	Irri.	Pl. Prot.	Harvest
Coimbatore	CL	8.2	L	M	H	Deep	Fallow	COH 10	80	40	40	10/08/24	21/08/24	APT	21/08/24 12/09/24	21/08/24 12/09/24	5	-	23/11/24
PMAT 4																			
Hisar	SL	7.8	159 kg/ha	17.9 kg/ha	178 kg/ha	Deep	Fallow	APT	APT	APT	-	13/07/24	31/07/24	08/08/24	4/8/24 21/8/24	4/8/24 21/8/24	-	-	12/10/24
Jamnagar	CL	7.6	L	M	H	60 cm	Groundnut	APT	APT	APT	-	26/07/24	08/08/24	20/08/24	12/08/24 21/08/24	12/08/24 21/08/24	1	-	As per maturity
Aurangabad	MDB	8.2	L	M	H	60 cm	Fallow	APT	APT	APT	30	03/07/24	10/07/24	29/07/24	13/08/24	13/08/24	-	-	As per
Vijayapur	MB	8.4	L	L	H	30-45 cm	Fallow	APT	APT	APT	-	13/07/24	30/07/24	APT	09/08/24	09/08/24	1	-	As per
Coimbatore	CL	8.2	L	M	H	Deep	Fallow	APT	APT	APT	35	09/08/24	20/08/24	APT	25/08/24 09/09/24	25/08/24 09/09/24	5	-	As per maturity
PMAT 7																			
Bikaner	LS	7.7	L	L	M	Deep	Fallow	HHB 299	APT	APT	-	07/07/24	28/07/24	-	16/08/24 28/08/24	16/08/24 28/08/24	-	-	18/10/24
Mandor	SL	8.3	L	M	H	Deep	Pearl Millet	HHB 299	APT	APT	-	05/07/24	26/07/24	APT	01/08/24 15/08/24	01/08/24 15/08/24	-	-	06/10/24
Jaipur	LS	7.6	L	M	M	Deep	-	RHB 233	APT	APT	-	15/07/24	05/08/24	APT	08/08/24	08/08/24	-	-	10/10/24
Hisar	SL	8.1	144 kg/ha	18.1 kg/ha	187 kg/ha	Deep	Fallow	HHB 299	APT	APT	-	30/07/24	19/08/24	28/8/24 31/8/24	14/8/24 22/8/24	14/8/24 22/8/24	-	-	14/10/24
Jamnagar	CL	7.6	L	M	H	60 cm	Mustard	GHB 1225	APT	APT	-	26/07/24	07/08/24	13/08/24	07/08/24 06/09/24	12/08/24 21/09/24	1	-	25/10/24
Jammu	SL	6.7	L	M	L	90 cm	Mustard	RHB 173	APT	APT	-	13/07/24	22/07/24	16/08/24	12/08/24 27/08/24	12/08/24 27/08/24	-	-	04/10/24
Aurangabad	MDB	8.2	L	M	H	60 cm	Fallow	AHB 1200	APT	APT	30	01/07/24	24/07/24	29/07/24	14/08/24	14/08/24	-	-	03/10/24
Dhule	MB	8.2	L	M	H	60-90 cm	Fallow	Aadishakti	APT	APT	-	06/07/24	21/07/24	08/08/24	29/07/24 30/07/24	29/07/24 30/07/24	-	-	07/10/24

Table II.2: Experimental details of Agronomy trials– *Kharif* 2024

Trials & Locations	Soil Status						Previous Crop	Variety Used	Nutrient (Kg/ha)			Date of operations carried							
	Type	pH	N	P	K	Depth/ Fe status			N	P	K	Sowing	Thinning	Top dresing	Weeding	Hoeing	Irri.	Pl. Prot.	Harvest
Vijayapur	MB	8.2	L	L	H	30-45 cm	Fallow	HHB 299	APT	APT		09/07/24	27/07/24	APT	27/07/24 22/08/24	27/07/24 22/08/24	1	-	14/10/24
Coimbatore	CL	8.3	L	M	H	Deep	Fallow	CO 10	APT	APT	40	10/08/24	22/08/24	-	23/08/24 12/09/24	23/08/24 12/09/24	5	-	22/11/24
Perumallapalle	SL	7.5	L	M	M	60 cm	Fallow	HHB 299	APT	APT	30	23/07/24	30/07/22	10/08/24	16/08/24 29/08/24	16/08/24 29/08/24	4	-	09/10/24

VL = Very Low H = High Input/agronomic operation not applied L = Low M = Medium APR = As per requirement

SL = Sandy loam LS = Lomy sand MB = Medium Black CL = Clay Loam APT = As per treatment MDB = Medium deep Black

Table II.3: PMAT 1A1: Performance of pearl Millet advance hybrids entries for yields and yield attributes as affected by nitrogen levels in Zone A1 during *kharif* 2024

Treatment		Grain yield (q/ha)			Stover yield (q/ha)			Days to 50% Flowering			Plant height (cm)			Plant population ('000/ha)			Total tillers/plant			Effective			Test weight (g)		
N(kg/ha)	Entries	BKR	MDR	Mean	BKR	MDR	Mean	BKR	MDR	Mean	BKR	MDR	Mean	BKR	MDR	Mean	BKR	MDR	Mean	BKR	MDR	Mean	BKR	MDR	Mean
0	MH 2672	24.90	11.47	**18.18**	55.80	21.33	**38.57**	45.3	45.0	**45.2**	169.1	135.2	**152.2**	128.9	103.0	**116.0**	3.7	2.1	**2.9**	3.4	1.9	**2.6**	8.3	8.3	**8.3**
	MH 2673	25.73	12.17	**18.95**	54.00	21.90	**37.95**	44.0	44.3	**44.2**	186.1	138.9	**162.5**	133.0	102.5	**117.8**	3.8	2.7	**3.2**	3.4	2.3	**2.9**	8.3	8.4	**8.4**
	MH 2675	22.23	12.00	**17.12**	58.23	21.00	**39.62**	46.3	45.0	**45.7**	179.6	137.8	**158.7**	130.6	104.1	**117.4**	3.2	2.5	**2.8**	3.0	2.2	**2.6**	8.1	8.1	**8.1**
	MH 2678	28.73	12.70	**20.72**	60.77	23.13	**41.95**	44.3	44.7	**44.5**	172.0	140.4	**156.2**	132.2	103.0	**117.6**	4.4	2.9	**3.7**	4.1	2.5	**3.3**	8.0	8.0	**8.0**
	HHB 67	15.63	10.80	**13.22**	37.33	21.50	**29.42**	46.0	44.7	**45.3**	176.4	128.9	**152.7**	130.6	104.2	**117.4**	2.0	1.9	**1.9**	1.8	1.5	**1.7**	8.4	8.4	**8.4**
	MPMH 21	22.77	11.73	**17.25**	51.83	22.40	**37.12**	44.0	45.3	**44.7**	184.2	136.7	**160.4**	129.0	102.4	**115.7**	3.3	2.3	**2.8**	3.0	1.9	**2.5**	8.4	8.3	**8.3**
	AHB 1200	13.63	10.70	**12.17**	50.27	19.27	**34.77**	47.7	46.3	**47.0**	195.8	126.4	**161.1**	129.0	104.2	**116.6**	1.6	1.7	**1.7**	1.2	1.5	**1.4**	8.3	8.7	**8.5**
	PB 1756	19.83	11.20	**15.52**	47.13	19.73	**33.43**	45.0	45.7	**45.3**	192.5	134.8	**163.7**	129.0	104.1	**116.5**	2.7	2.1	**2.4**	2.4	1.8	**2.1**	8.5	8.8	**8.7**
	RHB 223	15.37	11.10	**13.23**	46.07	21.10	**33.58**	46.7	45.0	**45.8**	172.6	129.8	**151.2**	130.2	105.3	**117.8**	2.0	2.0	**2.0**	1.7	1.8	**1.8**	8.4	8.8	**8.6**
	Mean	**20.98**	**11.54**	**16.26**	**51.27**	**21.26**	**36.27**	**45.5**	**45.1**	**45.3**	**180.9**	**134.3**	**157.6**	**130.3**	**103.6**	**117.0**	**3.0**	**2.2**	**2.6**	**2.7**	**1.9**	**2.3**	**8.3**	**8.4**	**8.4**
20	MH 2672	27.13	14.27	**20.70**	51.37	26.23	**38.80**	42.7	45.7	**44.2**	178.3	143.1	**160.7**	128.8	104.0	**116.4**	4.2	2.5	**3.4**	3.8	2.2	**3.0**	8.4	8.4	**8.4**
	MH 2673	22.67	15.13	**18.90**	54.60	27.53	**41.07**	44.3	45.0	**44.7**	175.6	148.7	**162.1**	131.6	103.7	**117.6**	3.3	3.0	**3.2**	3.0	2.7	**2.8**	8.9	8.8	**8.9**
	MH 2675	18.53	14.87	**16.70**	58.00	26.60	**42.30**	47.7	45.7	**46.7**	173.2	146.6	**159.9**	134.3	106.0	**120.2**	2.5	2.9	**2.7**	2.2	2.5	**2.4**	8.5	8.5	**8.5**
	MH 2678	22.60	15.57	**19.08**	58.77	28.33	**43.55**	44.3	45.3	**44.8**	162.6	152.3	**157.5**	130.4	104.4	**117.4**	3.2	3.1	**3.2**	2.9	2.7	**2.8**	8.2	8.2	**8.2**
	HHB 67	20.93	13.20	**17.07**	44.97	25.77	**35.37**	44.3	45.3	**44.8**	174.3	134.0	**154.2**	132.3	106.0	**119.1**	3.1	2.3	**2.7**	2.8	1.9	**2.4**	8.3	8.3	**8.3**
	MPMH 21	22.70	14.73	**18.72**	48.57	27.70	**38.13**	45.3	45.7	**45.5**	177.3	144.2	**160.7**	130.5	105.8	**118.2**	3.2	2.7	**3.0**	2.9	2.3	**2.6**	8.5	8.5	**8.5**
	AHB 1200	22.40	12.93	**17.67**	57.83	23.40	**40.62**	45.0	45.7	**45.3**	184.0	132.7	**158.4**	130.6	106.0	**118.3**	3.2	2.1	**2.7**	2.9	1.8	**2.4**	8.1	8.8	**8.4**
	PB 1756	27.00	14.03	**20.52**	59.33	25.27	**42.30**	44.3	45.7	**45.0**	182.5	141.7	**162.1**	130.6	104.7	**117.7**	4.2	2.4	**3.3**	3.9	2.1	**3.0**	8.5	9.0	**8.7**
	RHB 223	24.07	13.63	**18.85**	54.93	25.67	**40.30**	44.3	46.3	**45.3**	188.3	135.2	**161.8**	130.4	106.5	**118.5**	3.5	2.4	**3.0**	3.3	2.1	**2.7**	8.2	9.0	**8.6**
	Mean	**23.12**	**14.26**	**18.69**	**54.26**	**26.28**	**40.27**	**44.7**	**45.6**	**45.1**	**177.3**	**142.1**	**159.7**	**131.1**	**105.2**	**118.1**	**3.4**	**2.6**	**3.0**	**3.1**	**2.3**	**2.7**	**8.4**	**8.6**	**8.5**
40	MH 2672	28.23	17.43	**22.83**	61.40	31.40	**46.40**	44.3	45.7	**45.0**	178.3	153.5	**165.9**	130.1	104.4	**117.2**	4.4	3.3	**3.9**	4.0	3.0	**3.5**	8.4	8.4	**8.4**
	MH 2673	28.30	18.27	**23.28**	56.90	33.43	**45.17**	46.7	45.7	**46.2**	184.0	161.3	**172.7**	134.0	104.7	**119.4**	4.4	3.8	**4.1**	4.0	3.4	**3.7**	8.5	8.5	**8.5**
	MH 2675	22.13	17.93	**20.03**	57.83	31.57	**44.70**	46.7	45.7	**46.2**	178.3	157.8	**168.1**	131.7	105.5	**118.6**	3.3	3.7	**3.5**	3.0	3.3	**3.2**	8.3	8.2	**8.2**
	MH 2678	26.47	18.67	**22.57**	56.03	33.60	**44.82**	46.0	45.7	**45.8**	180.8	166.1	**173.4**	133.3	105.7	**119.5**	4.2	4.0	**4.1**	3.8	3.7	**3.8**	8.2	8.2	**8.2**
	HHB 67	20.73	16.73	**18.73**	53.70	31.77	**42.73**	45.7	45.3	**45.5**	167.2	145.6	**156.4**	131.7	106.2	**119.0**	2.9	2.8	**2.9**	2.7	2.4	**2.5**	8.6	8.5	**8.5**
	MPMH 21	25.90	17.60	**21.75**	52.37	32.60	**42.48**	48.3	45.7	**47.0**	172.1	155.2	**163.7**	130.2	106.5	**118.3**	3.9	3.5	**3.7**	3.6	3.3	**3.4**	8.5	8.5	**8.5**
	AHB 1200	23.50	16.30	**19.90**	49.43	29.33	**39.38**	48.7	45.7	**47.2**	165.5	142.8	**154.2**	130.2	106.0	**118.1**	3.5	2.7	**3.1**	3.2	2.3	**2.7**	8.4	8.9	**8.7**
	PB 1756	29.60	17.30	**23.45**	68.57	31.50	**50.03**	47.0	45.3	**46.2**	184.2	151.7	**168.0**	130.1	107.3	**118.7**	4.6	3.3	**3.9**	4.2	2.9	**3.6**	8.7	9.0	**8.9**
	RHB 223	24.07	16.77	**20.42**	58.87	30.37	**44.62**	46.3	46.3	**46.3**	181.7	147.5	**164.6**	131.3	108.0	**119.6**	3.5	3.0	**3.3**	3.3	2.7	**3.0**	8.6	9.0	**8.8**
	Mean	**25.44**	**17.44**	**21.44**	**57.23**	**31.73**	**44.48**	**46.6**	**45.7**	**46.1**	**176.9**	**153.5**	**165.2**	**131.4**	**106.0**	**118.7**	**3.9**	**3.3**	**3.6**	**3.5**	**3.0**	**3.3**	**8.5**	**8.6**	**8.5**

Table II.3: PMAT 1A1: Performance of pearl Millet advance hybrids entries for yields and yield attributes as affected by nitrogen levels in Zone A1 during *kharif* 2024

Treatment		Grain yield (q/ha)			Stover yield (q/ha)			Days to 50% Flowering			Plant height (cm)			Plant population ('000/ha)			Total tillers/plant			Effective			Test weight (g)		
N(kg/ha)	Entries	BKR	MDR	Mean	BKR	MDR	Mean	BKR	MDR	Mean	BKR	MDR	Mean	BKR	MDR	Mean	BKR	MDR	Mean	BKR	MDR	Mean	BKR	MDR	Mean
60	MH 2672	27.53	18.63	**23.08**	58.53	34.47	**46.50**	46.7	46.0	**46.3**	171.2	161.9	**166.6**	129.9	105.7	**117.8**	4.3	3.8	**4.1**	4.0	3.3	**3.6**	8.5	8.8	**8.6**
	MH 2673	30.43	19.73	**25.08**	57.33	37.30	**47.32**	46.7	46.0	**46.3**	170.9	172.5	**171.7**	132.6	105.9	**119.2**	4.7	4.1	**4.4**	4.4	3.6	**4.0**	9.1	8.9	**9.0**
	MH 2675	29.60	19.33	**24.47**	60.00	35.20	**47.60**	45.7	45.7	**45.7**	184.1	170.5	**177.3**	135.3	107.4	**121.3**	4.7	3.9	**4.3**	4.3	3.6	**4.0**	8.6	8.7	**8.7**
	MH 2678	32.17	20.40	**26.28**	61.23	38.33	**49.78**	45.3	45.7	**45.5**	171.3	174.4	**172.9**	131.5	106.3	**118.9**	5.1	4.4	**4.7**	4.7	4.0	**4.3**	8.3	8.3	**8.3**
	HHB 67	22.83	17.53	**20.18**	57.00	34.87	**45.93**	46.0	46.3	**46.2**	177.5	152.7	**165.1**	133.3	107.3	**120.3**	3.3	3.5	**3.4**	3.0	2.9	**3.0**	8.4	8.6	**8.5**
	MPMH 21	29.20	19.07	**24.13**	53.10	36.60	**44.85**	45.7	45.7	**45.7**	181.7	164.6	**173.2**	131.6	106.7	**119.2**	4.5	3.9	**4.2**	4.1	3.4	**3.8**	8.6	8.7	**8.7**
	AHB 1200	21.67	17.30	**19.48**	57.37	30.97	**44.17**	49.3	46.0	**47.7**	183.0	150.6	**166.8**	131.7	107.0	**119.3**	3.3	3.2	**3.3**	3.0	2.8	**2.9**	8.2	8.9	**8.6**
	PB 1756	24.47	18.50	**21.48**	60.57	34.03	**47.30**	43.0	46.3	**44.7**	191.0	160.5	**175.7**	131.7	108.2	**119.9**	3.6	3.7	**3.7**	3.3	3.2	**3.3**	8.6	9.0	**8.8**
	RHB 223	24.23	17.93	**21.08**	53.83	33.73	**43.78**	44.7	46.3	**45.5**	185.3	155.2	**170.3**	131.5	107.8	**119.6**	3.6	3.6	**3.6**	3.3	3.1	**3.2**	8.3	9.0	**8.7**
	Mean	**26.90**	**18.72**	**22.81**	**57.66**	**35.06**	**46.36**	**45.9**	**46.0**	**45.9**	179.6	**162.6**	**171.1**	132.1	**106.9**	**119.5**	4.1	**3.8**	**4.0**	3.8	**3.3**	**3.6**	8.5	**8.8**	**8.6**
Entries Mean	MH 2672	26.95	15.45	**21.20**	56.78	28.36	**42.57**	44.8	45.6	**45.2**	174.2	148.4	**161.3**	129.4	104.3	**116.9**	4.2	3.0	**3.6**	3.8	2.6	**3.2**	8.4	8.4	**8.4**
	MH 2673	26.78	16.33	**21.55**	55.71	30.04	**42.88**	45.4	45.3	**45.3**	179.2	155.4	**167.3**	132.8	104.2	**118.5**	4.0	3.4	**3.7**	3.7	3.0	**3.3**	8.7	8.7	**8.7**
	MH 2675	23.13	16.03	**19.58**	58.52	28.59	**43.55**	46.6	45.5	**46.0**	178.8	153.2	**166.0**	133.0	105.7	**119.4**	3.4	3.2	**3.3**	3.1	2.9	**3.0**	8.4	8.4	**8.4**
	MH 2678	27.49	16.83	**22.16**	59.20	30.85	**45.03**	45.0	45.3	**45.2**	171.7	158.3	**165.0**	131.8	104.9	**118.4**	4.2	3.6	**3.9**	3.9	3.2	**3.6**	8.2	8.2	**8.2**
	HHB 67	20.03	14.57	**17.30**	48.25	28.48	**38.36**	45.5	45.4	**45.5**	173.9	140.3	**157.1**	132.0	105.9	**119.0**	2.9	2.6	**2.7**	2.6	2.2	**2.4**	8.4	8.4	**8.4**
	MPMH 21	25.14	15.78	**20.46**	51.47	29.83	**40.65**	45.8	45.6	**45.7**	178.8	150.2	**164.5**	130.3	105.4	**117.8**	3.8	3.1	**3.4**	3.4	2.7	**3.1**	8.5	8.5	**8.5**
	AHB 1200	20.30	14.31	**17.30**	53.73	25.74	**39.73**	47.7	45.9	**46.8**	182.1	138.2	**160.1**	130.4	105.8	**118.1**	2.9	2.4	**2.7**	2.6	2.1	**2.3**	8.2	8.8	**8.5**
	PB 1756	25.23	15.26	**20.24**	58.90	27.63	**43.27**	44.8	45.8	**45.3**	187.5	147.2	**167.4**	130.4	106.0	**118.2**	3.8	2.9	**3.3**	3.5	2.5	**3.0**	8.6	9.0	**8.8**
	RHB 223	21.93	14.86	**18.40**	53.43	27.72	**40.57**	45.5	46.0	**45.8**	182.0	142.0	**162.0**	130.8	106.9	**118.9**	3.2	2.8	**3.0**	2.9	2.4	**2.6**	8.4	9.0	**8.7**
CD (5%)	**N**	NS	0.38		NS	0.69		NS	0.5		NS	3.4		NS	1.3		NS	0.1		NS	0.2		NS	0.1	
	E	4.05	0.65		6.85	1.19		NS	0.5		8.44	3.2		NS	1.4		0.8	0.2		0.7	0.2		NS	0.2	
	N x E	NS	NS		NS	NS		NS	NS		NS	NS		NS	NS		NS	NS		NS	NS		NS	NS	
	E x N	NS	NS		NS	NS		NS	NS		NS	NS		NS	NS		NS	NS		NS	NS		NS	NS	
CV (%)		20.5	5.1		15.2	5.1		5.2	1.3		5.8	2.6		4.5	1.7		26.0	7.3		26.6	7.3		5.3	2.2	

Table II.4: PMAT 1a: Performance of pearl millet medium and late advance hybrids entries for grain yield, stover yield, days to 50% flowering and plant height as affected by nitrogen levels in Zone A during *kharif* 2024

Treatment		Grain yield (q/ha)					Stover yield (q/ha)					Days to 50% Flowering			Plant height (cm)				
N(kg/ha)	Entries	HSR	JMR	JPR	NDL	Mean	HSR	JMR	JPR	NDL	Mean	JMR	JPR	Mean	HSR	JMR	JPR	NDL	Mean
0	MH 2709	27.70	27.27	26.47	23.45	**26.22**	93.82	38.25	61.93	68.54	**65.63**	47.3	58.0	**52.7**	254.3	177.3	204.3	207.3	**210.8**
	MH 2712	30.75	29.38	26.49	22.38	**27.25**	100.92	44.31	61.98	64.96	**68.04**	50.0	49.7	**49.8**	275.0	193.7	202.0	212.7	**220.8**
	MH 2717	32.63	28.76	25.58	21.89	**27.22**	102.04	42.25	59.82	66.77	**67.72**	48.7	52.3	**50.5**	250.0	183.0	191.7	205.3	**207.5**
	AHB 1200 (C)	25.28	17.51	16.45	19.55	**19.70**	86.57	25.28	38.51	61.64	**53.00**	43.0	46.3	**44.7**	206.7	157.9	198.3	200.0	**190.7**
	86M86 (C)	29.52	21.14	16.45	21.60	**22.18**	90.84	35.25	38.50	61.94	**56.63**	48.7	49.7	**49.2**	238.3	180.7	208.3	210.3	**209.4**
	86M84 (C)	27.54	25.18	18.33	20.14	**22.80**	98.96	37.91	42.90	58.53	**59.57**	49.3	49.0	**49.2**	255.0	181.8	198.3	208.3	**210.9**
	KBH 108 (C)	27.57	23.24	14.49	18.51	**20.95**	101.37	37.07	33.91	60.03	**58.09**	50.7	51.7	**51.2**	275.0	187.5	202.7	207.3	**218.1**
	MP 7878 (C)	26.41	28.76	13.06	11.88	**20.03**	102.21	43.60	30.55	46.46	**55.70**	51.0	47.3	**49.2**	273.3	191.0	198.3	208.3	**217.7**
	Mean	**28.42**	**25.16**	**19.67**	**19.93**	**23.29**	**97.09**	**37.99**	**46.01**	**61.11**	**60.55**	**48.6**	**50.5**	**49.5**	**253.5**	**181.6**	**200.5**	**207.5**	**210.8**
30	MH 2709	32.38	31.32	29.89	26.38	**29.99**	104.85	40.28	69.92	78.92	**73.49**	48.7	61.7	**55.2**	261.7	182.8	235.0	240.7	**230.0**
	MH 2712	34.34	32.77	27.68	26.67	**30.36**	112.64	51.60	64.73	74.70	**75.92**	50.7	51.7	**51.2**	281.7	201.8	214.3	232.0	**232.5**
	MH 2717	37.08	32.52	27.12	25.47	**30.55**	115.09	47.11	63.46	77.80	**75.86**	50.0	51.3	**50.7**	261.3	188.7	216.0	226.0	**223.0**
	AHB 1200 (C)	30.09	19.36	17.38	23.21	**22.51**	101.68	29.18	40.64	71.92	**60.86**	44.7	48.3	**46.5**	213.3	163.3	181.7	205.0	**190.8**
	86M86 (C)	33.50	24.35	17.66	24.89	**25.10**	106.38	42.86	41.33	70.75	**65.33**	50.0	52.7	**51.3**	252.7	185.5	205.0	220.7	**216.0**
	86M84 (C)	32.65	27.27	20.71	24.10	**26.18**	110.43	41.94	48.46	68.96	**67.45**	50.7	50.3	**50.5**	262.3	188.6	191.7	227.0	**217.4**
	KBH 108 (C)	33.27	26.27	16.57	22.01	**24.53**	114.71	41.32	38.78	68.59	**65.85**	52.0	54.7	**53.3**	280.0	191.3	188.3	223.0	**220.7**
	MP 7878 (C)	33.03	32.18	16.62	14.72	**24.14**	113.28	45.00	38.89	52.72	**62.48**	52.7	50.3	**51.5**	276.7	198.7	196.7	213.7	**221.4**
	Mean	**33.29**	**28.26**	**21.70**	**23.43**	**26.67**	**109.88**	**42.41**	**50.78**	**70.55**	**68.40**	**49.9**	**52.6**	**51.3**	**261.2**	**187.6**	**203.6**	**223.5**	**219.0**
60	MH 2709	36.91	34.67	30.10	32.24	**33.48**	110.94	43.28	70.45	87.23	**77.97**	49.0	61.7	**55.3**	267.3	190.6	217.7	247.3	**230.7**
	MH 2712	38.73	35.77	28.33	30.01	**33.21**	117.10	54.55	66.31	84.22	**80.55**	52.7	53.7	**53.2**	285.7	209.3	240.0	243.7	**244.7**
	MH 2717	40.80	37.10	27.29	29.31	**33.62**	119.91	49.32	63.84	85.27	**79.58**	51.3	54.3	**52.8**	266.7	190.3	190.0	238.0	**221.2**
	AHB 1200 (C)	33.10	22.19	17.70	27.85	**25.21**	106.94	31.42	41.40	78.11	**64.47**	45.0	48.3	**46.7**	217.7	166.9	191.7	218.0	**198.6**
	86M86 (C)	36.78	26.10	18.10	29.25	**27.56**	111.02	46.40	42.35	78.33	**69.53**	51.0	53.7	**52.3**	258.0	188.3	206.7	237.7	**222.7**
	86M84 (C)	36.42	31.50	21.16	27.46	**29.14**	116.75	45.01	49.51	72.22	**70.87**	51.0	52.0	**51.5**	266.7	191.7	220.0	235.7	**228.5**
	KBH 108 (C)	37.50	28.43	17.77	26.31	**27.50**	120.24	43.22	41.59	77.64	**70.67**	52.7	58.3	**55.5**	285.0	199.1	218.3	234.0	**234.1**
	MP 7878 (C)	36.86	33.11	20.11	16.69	**26.69**	119.36	48.24	47.05	60.45	**68.77**	53.0	52.3	**52.7**	280.0	203.5	243.3	219.7	**236.6**
	Mean	**37.14**	**31.11**	**22.57**	**27.39**	**29.55**	**115.28**	**45.18**	**52.81**	**77.94**	**72.80**	**50.7**	**54.3**	**52.5**	**265.9**	**192.5**	**216.0**	**234.3**	**227.1**

Table II.4: PMAT 1a: Performance of pearl millet medium and late advance hybrids entries for grain yield, stover yield, days to 50% flowering and plant height as affected by nitrogen levels in Zone A during *kharif* 2024

Treatment		Grain yield (q/ha)					Stover yield (q/ha)					Days to 50% Flowering			Plant height (cm)				
N(kg/ha)	Entries	HSR	JMR	JPR	NDL	Mean	HSR	JMR	JPR	NDL	Mean	JMR	JPR	Mean	HSR	JMR	JPR	NDL	Mean
90	MH 2709	39.10	37.60	33.57	34.38	**36.16**	115.57	47.92	78.53	88.40	**82.60**	50.3	61.3	**55.8**	270.3	195.1	228.3	254.7	**237.1**
	MH 2712	41.96	40.11	31.49	33.67	**36.81**	122.35	58.54	73.67	87.35	**85.48**	53.7	54.7	**54.2**	289.3	219.5	240.0	250.3	**249.8**
	MH 2717	44.18	37.57	29.56	31.76	**35.77**	125.30	50.94	69.14	86.55	**82.98**	52.7	56.3	**54.5**	268.3	195.5	219.0	241.0	**231.0**
	AHB 1200 (C)	34.90	26.92	19.92	29.02	**27.69**	110.48	34.34	46.61	82.21	**68.41**	46.0	48.0	**47.0**	220.3	169.9	198.3	222.0	**202.6**
	86M86 (C)	39.69	29.41	18.22	32.03	**29.84**	116.17	49.59	42.63	83.46	**72.96**	52.0	53.7	**52.8**	262.3	203.1	206.7	247.3	**229.9**
	86M84 (C)	38.57	37.81	27.14	29.99	**33.38**	120.42	47.04	63.49	77.22	**77.04**	52.0	51.0	**51.5**	269.7	198.2	220.0	241.3	**232.3**
	KBH 108 (C)	40.43	31.12	21.18	28.64	**30.34**	122.50	47.26	49.57	76.42	**73.94**	53.3	59.0	**56.2**	289.3	205.1	218.3	236.3	**237.3**
	MP 7878 (C)	40.39	36.66	19.56	16.98	**28.40**	121.95	52.08	45.76	61.12	**70.23**	54.3	53.0	**53.7**	284.3	208.9	238.3	221.0	**238.1**
	Mean	**39.90**	**34.65**	**25.08**	**29.56**	**32.30**	**119.34**	**48.46**	**58.68**	**80.34**	**76.71**	**51.8**	**54.6**	**53.2**	269.3	**199.4**	**221.1**	**239.3**	**232.3**
Entries Mean	MH 2709	34.02	32.72	30.01	29.11	**31.46**	106.29	42.43	70.21	80.77	**74.93**	48.8	60.7	**54.8**	263.4	186.5	221.3	237.5	**227.2**
	MH 2712	36.44	34.51	28.50	28.18	**31.91**	113.25	52.25	66.67	77.81	**77.50**	51.8	52.4	**52.1**	282.9	206.1	224.1	234.7	**236.9**
	MH 2717	38.67	33.99	27.39	27.11	**31.79**	115.59	47.40	64.06	79.10	**76.54**	50.7	53.6	**52.1**	261.6	189.4	204.2	227.6	**220.7**
	AHB 1200 (C)	30.84	21.50	17.86	24.91	**23.78**	101.42	30.05	41.79	73.47	**61.68**	44.7	47.8	**46.2**	214.5	164.5	192.5	211.3	**195.7**
	86M86 (C)	34.87	25.25	17.61	26.94	**26.17**	106.10	43.53	41.20	73.62	**66.11**	50.4	52.4	**51.4**	252.8	189.4	206.7	229.0	**219.5**
	86M84 (C)	33.79	30.44	21.83	25.42	**27.87**	111.64	42.97	51.09	69.23	**68.73**	50.8	50.6	**50.7**	263.4	190.1	207.5	228.1	**222.3**
	KBH 108 (C)	34.69	27.27	17.50	23.87	**25.83**	114.71	42.22	40.96	70.67	**67.14**	52.2	55.9	**54.0**	282.3	195.8	206.9	225.2	**227.5**
	MP 7878 (C)	34.17	32.68	17.34	15.07	**24.81**	114.20	47.23	40.56	55.19	**64.30**	52.8	50.8	**51.8**	278.6	200.5	219.2	215.7	**228.5**
CD (5%)	**N**	1.32	2.69	1.32	1.40		1.97	4.37	3.07	2.07		2.1	0.6		6.0	7.2	10.0	5.5	
	E	1.58	2.59	2.29	2.56		3.84	4.23	5.33	5.13		1.3	1.3		4.4	5.3	10.9	9.4	
	N x E	NS	NS	NS	NS		NS	NS	NS	NS		NS	NS		NS	NS	22.5	NS	
	E x N	NS	NS	NS	NS		NS	NS	NS	NS		NS	NS		NS	NS	22.6	NS	
CV (%)		5.6	10.6	12.5	12.4		4.2	11.8	12.5	8.6		3.3	2.9		2.1	3.4	6.3	5.1	

Table II.5: PMAT 1a: Effect of N levels on total & effective tillers/plant, test weight and plant populatiion of pearl millet medium and late advance hybrids entries in Zone A during *kharif* 2024

Treatment		Total tillers/plant					Effective Tillers/plant					Test weight (g)					Plant population ('000/ha)				
N(kg/ha)	Entries	HSR	JMR	JPR	NDL	Mean	HSR	JMR	JPR	NDL	Mean	HSR	JMR	JPR	NDL	Mean	HSR	JMR	JPR	NDL	Mean
0	MH 2709	2.6	3.1	2.7	2.9	**2.8**	2.3	2.2	1.7	1.9	**2.0**	10.7	9.9	11.4	9.5	**10.4**	132.3	161.11	163.3	168.5	**156.3**
	MH 2712	2.9	3.4	2.7	2.8	**3.0**	2.5	2.6	2.0	2.0	**2.3**	9.9	10.9	11.2	9.2	**10.3**	128.3	160.42	163.7	169.7	**155.5**
	MH 2717	3.0	3.3	2.3	2.8	**2.8**	2.7	2.5	1.4	1.9	**2.1**	10.9	10.1	11.1	9.6	**10.4**	129.8	164.24	162.3	167.8	**156.1**
	AHB 1200 (C)	2.3	2.5	2.0	2.2	**2.3**	1.9	2.0	1.1	1.4	**1.6**	10.4	8.3	11.0	8.5	**9.6**	127.7	160.07	166.3	168.5	**155.7**
	86M86 (C)	2.9	2.7	2.7	2.9	**2.8**	2.6	2.1	1.7	2.0	**2.1**	10.7	8.5	11.5	9.2	**10.0**	124.2	163.19	166.3	169.4	**155.8**
	86M84 (C)	2.7	3.1	2.7	2.9	**2.8**	2.5	2.3	1.8	1.8	**2.1**	10.5	9.8	10.5	9.2	**10.0**	126.8	162.50	166.0	169.1	**156.1**
	KBH 108 (C)	3.0	2.9	2.7	2.9	**2.9**	2.7	2.1	1.7	1.9	**2.1**	10.8	9.3	10.3	8.7	**9.7**	126.5	163.54	169.3	170.9	**157.6**
	MP 7878 (C)	2.9	3.1	3.0	2.8	**3.0**	2.5	2.3	2.0	1.9	**2.2**	10.7	10.1	11.0	6.9	**9.7**	125.5	161.81	164.3	168.1	**154.9**
	Mean	**2.8**	**3.0**	**2.6**	**2.8**	**2.8**	**2.5**	**2.3**	**1.7**	**1.9**	**2.1**	**10.6**	**9.6**	**11.0**	**8.9**	**10.0**	**127.6**	**162.11**	**165.2**	**169.0**	**156.0**
30	MH 2709	2.8	3.2	3.3	3.1	**3.1**	2.4	2.4	2.2	2.2	**2.3**	10.8	10.4	11.4	10.1	**10.7**	134.2	162.50	166.7	171.2	**158.6**
	MH 2712	3.1	3.6	3.3	3.0	**3.3**	2.6	2.9	2.4	2.4	**2.6**	10.0	12.3	11.2	9.6	**10.8**	128.0	162.85	169.0	166.1	**156.5**
	MH 2717	3.3	3.5	3.0	3.0	**3.2**	2.8	2.7	2.2	2.0	**2.4**	11.0	11.2	11.1	9.9	**10.8**	130.2	161.11	174.7	168.2	**158.5**
	AHB 1200 (C)	2.7	2.9	2.0	2.3	**2.5**	2.0	2.3	2.1	1.5	**2.0**	10.5	9.1	11.0	8.9	**9.9**	126.7	162.85	168.7	168.6	**156.7**
	86M86 (C)	3.1	3.0	2.7	3.2	**3.0**	2.7	2.4	1.7	2.3	**2.3**	10.8	9.4	11.6	9.7	**10.3**	125.8	162.15	165.7	167.6	**155.3**
	86M84 (C)	3.0	3.1	2.9	3.1	**3.0**	2.6	2.5	1.9	2.3	**2.3**	10.6	10.4	10.8	9.7	**10.4**	127.2	162.15	166.0	169.9	**156.3**
	KBH 108 (C)	3.2	3.3	2.7	3.1	**3.1**	2.8	2.3	2.1	2.2	**2.4**	10.9	10.1	10.7	9.1	**10.2**	127.3	162.85	166.3	170.5	**156.8**
	MP 7878 (C)	3.1	3.4	2.8	3.0	**3.1**	2.6	2.7	2.1	2.1	**2.4**	10.8	10.5	10.8	7.9	**10.0**	126.5	162.85	169.0	171.7	**157.5**
	Mean	**3.0**	**3.3**	**2.8**	**3.0**	**3.0**	**2.6**	**2.5**	**2.1**	**2.1**	**2.3**	**10.7**	**10.4**	**11.1**	**9.4**	**10.4**	**128.2**	**162.41**	**168.3**	**169.2**	**157.0**
60	MH 2709	2.9	3.3	3.7	3.4	**3.3**	2.5	2.7	2.4	2.7	**2.6**	10.9	10.8	11.9	10.4	**11.0**	133.2	163.19	166.0	170.0	**158.1**
	MH 2712	3.2	3.7	4.0	3.3	**3.6**	2.7	3.1	2.6	2.6	**2.7**	10.1	13.3	11.3	10.5	**11.3**	130.3	162.20	166.3	168.2	**156.8**
	MH 2717	3.4	3.5	4.0	3.2	**3.5**	2.9	3.1	2.4	2.2	**2.7**	11.1	11.4	11.2	10.6	**11.1**	130.7	162.50	167.0	169.9	**157.5**
	AHB 1200 (C)	2.9	3.2	2.7	2.5	**2.8**	2.1	2.4	2.2	2.2	**2.2**	10.5	9.3	11.2	9.9	**10.2**	128.1	162.15	164.0	171.4	**156.4**
	86M86 (C)	3.2	3.3	3.0	3.5	**3.3**	2.8	2.6	1.9	2.6	**2.5**	10.9	10.0	11.8	10.4	**10.8**	126.3	161.81	166.7	169.2	**156.0**
	86M84 (C)	3.1	3.4	3.3	3.5	**3.3**	2.7	2.7	2.2	2.5	**2.5**	10.7	10.8	10.6	10.2	**10.6**	127.5	162.84	163.0	170.7	**156.0**
	KBH 108 (C)	3.3	3.5	2.6	3.4	**3.2**	2.9	2.4	2.4	2.5	**2.6**	11.1	10.7	11.5	10.0	**10.8**	128.5	162.85	167.3	169.9	**157.1**
	MP 7878 (C)	3.2	3.5	2.7	3.3	**3.2**	2.7	2.7	2.1	2.1	**2.4**	11.0	10.8	10.9	8.2	**10.2**	127.9	164.93	173.3	171.6	**159.5**
	Mean	**3.2**	**3.4**	**3.2**	**3.3**	**3.3**	**2.7**	**2.7**	**2.3**	**2.4**	**2.5**	**10.8**	**10.9**	**11.3**	**10.0**	**10.7**	**129.1**	**162.81**	**166.7**	**170.1**	**157.2**

Table II.5: PMAT 1a: Effect of N levels on total & effective tillers/plant, test weight and plant populatiion of pearl millet medium and late advance hybrids entries in Zone A during *kharif* 2024

Treatment		Total tillers/plant					Effective Tillers/plant					Test weight (g)					Plant population ('000/ha)				
N(kg/ha)	Entries	HSR	JMR	JPR	NDL	Mean	HSR	JMR	JPR	NDL	Mean	HSR	JMR	JPR	NDL	Mean	HSR	JMR	JPR	NDL	Mean
90	MH 2709	3.0	3.5	4.0	3.5	**3.5**	2.6	3.1	2.7	2.9	**2.8**	10.9	11.4	12.4	11.1	**11.5**	133.3	162.85	165.7	170.0	**158.0**
	MH 2712	3.3	3.9	4.0	3.3	**3.6**	2.8	3.5	2.8	3.0	**3.0**	10.2	13.9	11.5	11.0	**11.6**	130.3	163.89	166.0	170.3	**157.6**
	MH 2717	3.5	3.7	4.2	3.2	**3.7**	2.9	3.2	2.6	2.9	**2.9**	11.1	11.9	11.7	10.7	**11.3**	131.2	162.50	166.3	170.7	**157.7**
	AHB 1200 (C)	3.0	3.3	2.7	2.7	**2.9**	2.2	2.5	2.4	2.4	**2.4**	10.6	10.1	11.7	9.8	**10.6**	129.2	164.93	169.0	170.2	**158.3**
	86M86 (C)	3.3	3.4	3.0	3.4	**3.3**	2.8	2.7	2.1	2.9	**2.6**	11.0	10.3	12.3	10.6	**11.0**	126.7	162.50	166.0	170.6	**156.4**
	86M84 (C)	3.2	3.5	3.0	3.4	**3.3**	2.7	2.9	2.4	2.9	**2.7**	10.8	11.4	11.1	10.7	**11.0**	128.3	163.54	166.3	170.2	**157.1**
	KBH 108 (C)	3.4	3.7	3.7	3.5	**3.6**	3.0	2.7	2.7	2.9	**2.8**	11.1	10.9	10.8	10.6	**10.8**	128.5	163.19	167.0	169.2	**157.0**
	MP 7878 (C)	3.3	3.8	2.7	3.3	**3.3**	2.7	2.9	2.3	2.2	**2.5**	11.1	11.1	11.4	8.2	**10.4**	128.3	163.19	164.0	169.2	**156.2**
	Mean	**3.3**	**3.6**	**3.4**	**3.3**	**3.4**	**2.7**	**2.9**	**2.5**	**2.8**	**2.7**	**10.8**	**11.4**	**11.6**	**10.3**	**11.0**	**129.5**	**163.33**	**166.3**	**170.0**	**157.3**
Entries Mean	MH 2709	2.8	3.3	3.4	3.2	**3.2**	2.5	2.6	2.3	2.4	**2.4**	10.8	10.6	11.8	10.3	**10.9**	133.3	162.41	165.4	169.9	**157.8**
	MH 2712	3.1	3.7	3.5	3.1	**3.4**	2.6	3.0	2.5	2.5	**2.7**	10.1	12.6	11.3	10.1	**11.0**	129.3	162.34	166.3	168.6	**156.6**
	MH 2717	3.3	3.5	3.4	3.0	**3.3**	2.8	2.9	2.2	2.3	**2.5**	11.0	11.2	11.3	10.2	**10.9**	130.5	162.59	167.6	169.1	**157.4**
	AHB 1200 (C)	2.7	3.0	2.3	2.4	**2.6**	2.1	2.3	2.0	1.9	**2.0**	10.5	9.2	11.2	9.3	**10.1**	127.9	162.50	167.0	169.7	**156.8**
	86M86 (C)	3.1	3.1	2.8	3.2	**3.1**	2.7	2.5	1.8	2.4	**2.4**	10.8	9.5	11.8	10.0	**10.5**	125.8	162.41	166.2	169.2	**155.9**
	86M84 (C)	3.0	3.3	3.0	3.2	**3.1**	2.6	2.6	2.1	2.4	**2.4**	10.6	10.6	10.8	9.9	**10.5**	127.4	162.76	165.3	170.0	**156.4**
	KBH 108 (C)	3.3	3.4	2.9	3.2	**3.2**	2.9	2.4	2.2	2.4	**2.5**	11.0	10.2	10.8	9.6	**10.4**	127.7	163.11	167.5	170.1	**157.1**
	MP 7878 (C)	3.1	3.5	2.8	3.1	**3.1**	2.6	2.7	2.1	2.1	**2.4**	10.9	10.6	11.0	7.8	**10.1**	127.1	163.19	167.7	170.2	**157.0**
CD (5%)	**N**	0.2	0.2	0.4	0.2		NS	0.2	0.1	0.3		NS	0.7	0.1	0.3		NS	NS	NS	NS	
	E	0.2	0.2	0.5	0.4		0.3	0.2	0.4	0.3		0.3	0.7	0.4	0.6		1.6	NS	NS	NS	
	N x E	NS	NS	NS	NS		NS	NS	NS	NS		NS	NS	NS	NS		NS	NS	NS	NS	
	E x N	NS	NS	NS	NS		NS	NS	NS	NS		NS	NS	NS	NS		NS	NS	NS	NS	
CV (%)		9.4	6.7	19.9	17.1		12.8	8.8	20.0	16.8		2.9	8.2	4.5	8.2		1.5	1.8	3.9	2.6	

Table II.6: PMAT 1b: Effect of N levels on productivity of pearl millet medium and late advance hybrids entries in Zone B during *kharif* 2024

Treatments		Grain yield (q/ha)				Zonal mean	Dry fodder yield (q/ha)				Zonal mean
N(kg/ha)	Entries	ABD1	DHL	VYP	CBE		ABD1	DHL	VYP	CBE	
0	MH 2682	20.53	-	9.66	29.24	**19.81**	41.36	-	31.02	45.76	**39.38**
	MH 2717	18.52	-	8.21	31.86	**19.53**	39.51	-	29.35	49.38	**39.41**
	AHB 1200 (c)	22.38	-	8.42	24.15	**18.31**	46.30	-	29.21	37.07	**37.53**
	86M86 (c)	16.94		8.49	31.19	**18.87**	39.20		29.03	50.00	**39.41**
	Pratap (c)	14.17	-	7.34	26.81	**16.11**	33.64	-	22.69	42.63	**32.99**
	86 M 01(c)	22.62	-	7.77	29.18	**19.86**	36.42	-	28.33	45.67	**36.81**
	AHB 1269 (c)	24.07	-	7.40	20.67	**17.38**	46.91	-	28.43	31.62	**35.65**
	NHB 4903 (c)	16.21	-	9.68	28.24	**18.04**	39.51	-	31.44	44.37	**38.44**
	Kaveri Super Boss (c)	18.70	-	9.25	32.18	**20.04**	41.67	-	30.93	50.78	**41.13**
	Mean	**19.35**	-	**8.47**	**28.17**	**18.66**	**40.50**	-	**28.94**	**44.14**	**37.86**
30	MH 2682	21.30	21.95	13.52	34.29	**22.76**	44.45	40.68	37.73	53.60	**44.11**
	MH 2717	20.19	23.65	11.49	35.29	**22.65**	43.21	46.17	34.68	55.02	**44.77**
	AHB 1200 (c)	25.00	20.89	12.00	28.67	**21.64**	47.53	37.31	31.39	45.18	**40.35**
	86M86 (c)	18.86	20.34	10.95	35.14	**21.32**	40.43	35.29	32.27	55.01	**40.75**
	Pratap (c)	16.05	15.26	11.63	31.05	**18.50**	38.58	26.29	30.14	48.51	**35.88**
	86 M 01(c)	23.85	19.95	12.75	36.27	**23.21**	41.36	34.62	32.13	56.30	**41.10**
	AHB 1269 (c)	25.93	20.65	11.77	24.34	**20.67**	48.15	36.89	31.62	39.16	**38.95**
	NHB 4903 (c)	18.98	19.65	12.55	33.18	**21.09**	43.83	36.20	36.06	51.88	**41.99**
	Kaveri Super Boss (c)	19.44	19.96	12.78	36.28	**22.12**	47.22	38.47	34.26	55.91	**43.96**
	Mean	**21.07**	**20.26**	**12.16**	**32.72**	**21.55**	**43.86**	**36.88**	**33.36**	**51.17**	**41.32**
60	MH 2682	22.84	24.65	16.94	38.15	**25.65**	48.77	45.68	41.34	58.61	**48.60**
	MH 2717	20.55	26.65	15.19	39.27	**25.42**	46.60	52.03	39.12	60.24	**49.50**
	AHB 1200 (c)	27.47	22.74	14.73	30.24	**23.79**	53.40	40.62	37.18	45.74	**44.23**
	86M86 (c)	20.68	22.27	12.41	37.42	**23.20**	43.52	38.64	38.66	57.17	**44.50**
	Pratap (c)	18.37	17.07	13.04	33.15	**20.41**	41.67	29.41	35.65	50.87	**39.40**
	86 M 01(c)	25.32	21.97	13.00	38.51	**24.70**	45.99	38.12	36.57	59.17	**44.96**
	AHB 1269 (c)	28.09	22.75	13.97	28.67	**23.37**	54.01	40.63	39.40	42.90	**44.24**
	NHB 4903 (c)	22.22	22.80	16.53	35.94	**24.37**	47.84	42.00	41.71	55.21	**46.69**
	Kaveri Super Boss (c)	22.84	23.06	16.38	39.67	**25.49**	50.62	44.44	40.46	60.04	**48.89**
	Mean	**23.15**	**22.66**	**14.69**	**35.67**	**24.04**	**48.05**	**41.28**	**38.90**	**54.44**	**45.67**

Table II.6: PMAT 1b: Effect of N levels on productivity of pearl millet medium and late advance hybrids entries in Zone B during *kharif* 2024

Treatments		Grain yield (q/ha)				Zonal mean	Dry fodder yield (q/ha)				Zonal mean
N(kg/ha)	Entries	ABD1	DHL	VYP	CBE		ABD1	DHL	VYP	CBE	
90	MH 2682	23.96	26.89	20.87	39.91	**27.91**	51.15	49.83	49.35	61.17	**52.88**
	MH 2717	21.56	28.03	18.71	41.18	**27.37**	48.89	54.72	46.25	62.09	**52.99**
	AHB 1200 (c)	28.81	24.88	17.54	32.09	**25.83**	56.01	44.44	43.89	48.49	**48.21**
	86M86 (c)	21.69	24.95	17.63	38.28	**25.64**	45.65	43.29	44.07	58.08	**47.77**
	Pratap (c)	19.26	20.96	17.21	34.29	**22.93**	43.71	36.12	42.13	51.86	**43.45**
	86 M 01(c)	26.74	23.95	16.44	39.62	**26.69**	53.58	41.56	46.53	60.27	**50.48**
	AHB 1269 (c)	29.46	25.62	18.13	30.08	**25.82**	56.66	45.76	45.09	44.82	**48.08**
	NHB 4903 (c)	23.31	24.85	19.95	36.82	**26.23**	50.18	45.77	48.06	55.73	**49.94**
	Kaveri Super Boss (c)	23.96	26.53	19.32	40.84	**27.66**	53.10	51.13	47.18	62.13	**53.38**
	Mean	**24.31**	**25.18**	**18.42**	**37.01**	**26.23**	**50.99**	**45.84**	**45.84**	**56.07**	**49.69**
Entries Mean	MH 2682	22.16	24.50	15.25	35.40	**24.32**	46.43	45.40	39.86	54.78	**46.62**
	MH 2717	20.21	26.11	13.40	36.90	**24.15**	44.55	50.97	37.35	56.68	**47.39**
	AHB 1200 (c)	25.91	22.84	13.17	28.79	**22.68**	50.81	40.79	35.42	44.12	**42.78**
	86M86 (c)	19.54	22.52	12.37	35.51	**22.49**	42.20	39.07	36.01	55.07	**43.09**
	Pratap (c)	16.96	17.76	12.31	31.33	**19.59**	39.40	30.61	32.65	48.47	**37.78**
	86 M 01(c)	24.63	21.96	12.49	35.90	**23.74**	44.34	38.10	35.89	55.35	**43.42**
	AHB 1269 (c)	26.89	23.01	12.82	25.94	**22.16**	51.43	41.09	36.13	39.62	**42.07**
	NHB 4903 (c)	20.18	22.43	14.68	33.55	**22.71**	45.34	41.32	39.32	51.80	**44.44**
	Kaveri Super Boss (c)	21.24	23.18	14.43	37.24	**24.02**	48.15	44.68	38.21	57.22	**47.06**
CD (5%)	**N**	2.32	NS	1.01	3.00		5.23	NS	1.61	4.53	
	E	2.54	2.41	1.06	2.85		4.18	4.31	1.90	4.35	
	N x E	NS	NS	NS	NS		NS	NS	NS	NS	
	E x N	NS	NS	NS	NS		NS	NS	NS	NS	
CV (%)		14.1	8.9	9.7	10.4		11.2	8.7	6.3	10.3	

Table II.7: PMAT 1b: Effect of N levels on total & effective tillers/plant of pearl millet medium and late advance hybrid entries in Zone B during *kharif* 2024

Treatment		Total tillers/plant					Effective Tillers/plant				
N(kg/ha)	Entries	ABD1	DHL	VYP	CBE	Mean	ABD1	DHL	VYP	CBE	Mean
0	MH 2682	3.1	-	3.2	3.3	3.2	2.2	-	2.5	2.6	2.4
	MH 2717	3.8	-	2.9	3.4	3.4	2.9	-	2.3	2.5	2.6
	AHB 1200 (c)	3.6	-	2.8	3.3	3.2	2.5	-	2.5	2.5	2.5
	86M86 (c)	3.8		2.9	4.2	3.6	2.8		2.4	3.3	2.9
	Pratap (c)	3.3	-	3.1	4.1	3.5	2.6	-	2.4	3.2	2.7
	86 M 01(c)	3.5	-	2.9	4.0	3.5	2.5	-	2.4	3.1	2.7
	AHB 1269 (c)	3.5	-	2.9	3.5	3.3	2.5	-	2.4	2.6	2.5
	NHB 4903 (c)	3.7	-	3.1	3.4	3.4	2.6	-	2.5	2.5	2.5
	Kaveri Super Boss (c)	3.6	-	2.9	3.4	3.3	2.5	-	2.4	2.5	2.5
	Mean	**3.6**	-	**3.0**	**3.6**	**3.4**	**2.6**	-	2.4	2.8	**2.6**
30	MH 2682	3.9	2.9	3.3	3.9	3.5	2.6	2.1	2.8	3.0	2.6
	MH 2717	3.5	3.3	3.3	4.0	3.5	2.6	2.4	2.5	3.1	2.6
	AHB 1200 (c)	3.7	3.2	3.3	3.7	3.5	2.7	2.5	2.5	2.8	2.6
	86M86 (c)	3.2	3.0	3.3	4.9	3.6	2.4	2.0	2.4	4.0	2.7
	Pratap (c)	3.7	2.5	3.2	4.5	3.5	2.7	2.0	2.7	3.6	2.8
	86 M 01(c)	4.0	2.7	3.1	4.3	3.5	2.9	2.0	2.5	3.4	2.7
	AHB 1269 (c)	3.4	2.9	3.3	4.0	3.4	2.5	2.0	2.5	3.1	2.5
	NHB 4903 (c)	3.3	2.5	3.4	4.0	3.3	2.3	2.1	2.7	3.1	2.5
	Kaveri Super Boss (c)	3.7	3.4	3.4	3.8	3.6	2.7	2.3	2.8	2.9	2.7
	Mean	**3.6**	**2.9**	**3.3**	**4.1**	**3.5**	**2.6**	2.2	**2.6**	**3.2**	**2.6**
60	MH 2682	4.1	3.2	3.7	4.1	3.8	3.1	2.5	3.0	3.2	2.9
	MH 2717	3.5	4.1	3.5	4.3	3.9	2.5	2.9	2.5	3.4	2.8
	AHB 1200 (c)	4.0	3.6	3.2	3.7	3.6	3.0	2.4	2.5	2.8	2.7
	86M86 (c)	4.1	3.2	3.5	5.1	4.0	3.1	2.4	2.5	4.2	3.0
	Pratap (c)	3.7	3.0	3.3	5.3	3.8	2.7	2.3	2.4	4.4	2.9
	86 M 01(c)	4.1	3.2	3.3	4.5	3.8	3.1	2.7	2.6	3.6	3.0
	AHB 1269 (c)	4.0	3.1	**3.5**	**4.1**	3.7	3.0	2.2	**2.6**	**3.2**	2.8
	NHB 4903 (c)	3.8	2.9	**3.7**	**4.2**	3.6	2.9	2.3	**2.9**	**3.3**	2.8
	Kaveri Super Boss (c)	4.8	3.9	**3.5**	**4.0**	4.0	3.8	2.7	**2.9**	**3.1**	3.1
	Mean	**4.0**	**3.3**	**3.5**	**4.3**	**3.8**	**3.0**	2.5	**2.7**	**3.5**	**2.9**
90	MH 2682	4.2	4.7	3.9	4.1	4.2	3.2	2.8	3.1	3.2	3.1
	MH 2717	4.1	4.9	3.6	4.3	4.2	3.3	3.2	3.0	3.4	3.2
	AHB 1200 (c)	4.7	4.7	3.6	3.8	4.2	3.9	2.8	2.9	2.9	3.1
	86M86 (c)	4.6	4.1	3.6	5.1	4.3	3.4	2.9	2.9	4.2	3.3
	Pratap (c)	3.6	3.3	3.5	4.8	3.8	2.7	2.7	2.7	3.9	3.0
	86 M 01(c)	4.0	3.4	3.5	4.6	3.9	3.0	3.0	3.0	3.7	3.2
	AHB 1269 (c)	5.2	3.4	3.7	4.1	4.1	4.3	3.0	2.9	3.2	3.3
	NHB 4903 (c)	4.9	3.4	3.9	4.2	4.1	3.9	3.0	3.1	3.3	3.3
	Kaveri Super Boss (c)	5.2	4.3	3.8	4.0	4.3	4.2	3.0	3.1	3.2	3.4
	Mean	**4.5**	**4.0**	**3.7**	**4.3**	**4.1**	**3.5**	2.9	**3.0**	**3.4**	**3.2**
Entries Mean	MH 2682	3.8	3.6	3.5	3.8	3.7	2.8	2.5	2.9	3.0	2.8
	MH 2717	3.7	4.1	3.3	4.0	3.8	2.8	2.8	2.6	3.1	2.8
	AHB 1200 (c)	4.0	3.8	3.2	3.6	3.7	3.0	2.6	2.6	2.7	2.7
	86M86 (c)	3.9	3.4	3.3	4.8	3.9	2.9	2.4	2.6	3.9	3.0
	Pratap (c)	3.6	2.9	3.3	4.6	3.6	2.7	2.3	2.6	3.8	2.8
	86 M 01(c)	3.9	3.1	3.2	4.3	3.6	2.9	2.5	2.6	3.5	2.9
	AHB 1269 (c)	4.0	3.1	3.4	3.9	3.6	3.1	2.4	2.6	3.0	2.8
	NHB 4903 (c)	3.9	2.9	3.5	3.9	3.6	2.9	2.4	2.8	3.1	2.8
	Kaveri Super Boss (c)	4.3	3.9	3.4	3.8	3.8	3.3	2.7	2.8	2.9	2.9
CD (5%)	**N**	0.3	0.6	0.1	0.2		0.2	0.4	0.0	0.2	
	E	0.2	0.8	0.1	0.3		0.2	NS	0.1	0.3	
	N x E	0.4	NS	0.2	NS		0.5	NS	0.2	NS	
	E x N	0.5	NS	0.2	NS		0.5	NS	0.2	NS	
CV (%)		6.4	19.4	2.7	10.1		9.5	18.6	4.3	12.8	

Table II.8: PMAT 1b: Effect of N levels on plant populatiion and plant height of pearl millet medium and late advance hybrids and population entries in Zone B during *kharif* 2024

Treatment		Plant population ('000/ha)					Plant height (cm)				
N(kg/ha)	Entries	ABD1	DHL	VYP	CBE	Mean	ABD1	DHL	VYP	CBE	Mean
0	MH 2682	205.6	-	134.7	125.0	155.1	147.7	-	146.1	148.5	147.4
	MH 2717	206.2	-	132.6	124.0	154.3	158.1	-	140.9	143.4	147.5
	AHB 1200 (c)	207.7	-	136.1	124.0	155.9	149.3	-	129.9	153.2	144.1
	86M86 (c)	205.2		138.0	124.0	155.7	148.6		129.2	164.3	147.4
	Pratap (c)	205.6	-	137.5	126.0	156.4	138.5	-	109.4	152.7	133.5
	86 M 01(c)	203.4	-	136.1	123.0	154.2	148.1	-	133.4	164.8	148.8
	AHB 1269 (c)	207.1	-	136.8	124.0	156.0	140.4	-	131.3	172.5	148.1
	NHB 4903 (c)	204.3	-	135.2	124.0	154.5	156.7	-	135.7	179.5	157.3
	Kaveri Super Boss (c)	202.2	-	138.9	123.0	154.7	157.5	-	132.2	203.1	164.3
	Mean	**205.2**	-	**136.2**	124.1	**155.2**	**149.4**	-	**132.0**	164.7	**148.7**
30	MH 2682	206.5	134.9	135.2	133.0	152.4	149.5	169.8	160.8	154.6	158.7
	MH 2717	206.2	135.1	134.5	134.0	152.4	153.0	183.8	163.3	148.3	162.1
	AHB 1200 (c)	206.5	133.9	135.6	132.0	152.0	151.3	174.5	141.9	165.5	158.3
	86M86 (c)	205.2	134.2	138.7	132.0	152.5	150.7	182.0	141.9	176.2	162.7
	Pratap (c)	203.4	134.4	135.9	130.0	150.9	140.4	143.7	115.7	158.3	139.5
	86 M 01(c)	204.6	134.3	141.7	132.0	153.1	150.5	179.7	146.8	173.4	162.6
	AHB 1269 (c)	206.2	132.7	134.7	128.0	150.4	148.6	176.5	139.7	179.4	161.1
	NHB 4903 (c)	207.4	134.8	135.9	129.0	151.8	157.9	178.8	166.7	186.4	172.4
	Kaveri Super Boss (c)	205.6	134.6	136.1	133.0	152.3	154.3	185.5	157.0	212.4	177.3
	Mean	**205.7**	**134.3**	**136.5**	**131.4**	**152.0**	**150.7**	**174.9**	**148.2**	**172.7**	**161.6**
60	MH 2682	207.7	135.1	138.2	135.0	154.0	150.1	183.0	181.4	163.6	169.5
	MH 2717	205.2	135.5	138.2	138.0	154.2	157.4	179.0	175.7	158.3	167.6
	AHB 1200 (c)	206.5	133.9	135.9	138.0	153.6	156.6	178.0	171.3	176.2	170.5
	86M86 (c)	206.8	134.2	135.4	135.0	152.8	157.8	189.5	168.0	182.3	174.4
	Pratap (c)	204.9	134.4	135.4	132.0	151.7	150.2	150.5	140.9	165.3	151.7
	86 M 01(c)	205.2	134.3	140.0	135.0	153.6	155.7	187.5	170.7	180.4	173.6
	AHB 1269 (c)	203.4	132.7	136.6	131.0	150.9	155.9	180.5	173.9	184.1	173.6
	NHB 4903 (c)	205.6	134.3	135.4	134.0	152.3	161.1	182.3	183.0	193.2	179.9
	Kaveri Super Boss (c)	207.1	134.7	138.2	138.0	154.5	166.9	192.0	181.2	223.7	190.9
	Mean	**205.8**	**134.3**	**137.0**	**135.1**	**153.1**	**156.9**	**180.3**	**171.8**	**180.8**	**172.4**
90	MH 2682	206.8	135.6	137.3	141.0	155.2	155.1	199.5	183.5	172.3	177.6
	MH 2717	205.2	135.8	138.0	138.0	154.3	161.2	203.4	182.5	162.4	177.4
	AHB 1200 (c)	206.8	134.6	134.0	143.0	154.6	160.6	186.8	177.0	182.3	176.7
	86M86 (c)	207.7	133.8	133.1	130.0	151.1	163.1	193.1	169.0	188.4	178.4
	Pratap (c)	206.2	132.7	135.4	139.0	153.3	153.1	160.5	128.8	169.4	153.0
	86 M 01(c)	205.9	134.4	136.6	130.0	151.7	163.4	193.1	176.3	185.2	179.5
	AHB 1269 (c)	204.9	133.2	137.5	146.0	155.4	160.5	184.0	179.9	188.2	178.1
	NHB 4903 (c)	206.2	132.7	135.4	130.0	151.1	165.7	185.5	185.9	199.4	184.1
	Kaveri Super Boss (c)	207.4	134.8	139.4	136.0	154.4	175.1	195.6	184.6	232.4	196.9
	Mean	**206.3**	**134.2**	**136.3**	**137.0**	**153.4**	**162.0**	**189.1**	**174.2**	**186.7**	**178.0**
Entries Mean	MH 2682	206.6	135.2	136.3	133.5	152.9	150.6	184.1	168.0	159.8	165.6
	MH 2717	205.7	135.5	135.8	133.5	152.6	157.4	188.7	165.6	153.1	166.2
	AHB 1200 (c)	206.9	134.1	135.4	134.3	152.7	154.4	179.8	155.0	169.3	164.6
	86M86 (c)	206.2	134.0	136.3	130.3	151.7	155.1	188.2	152.0	177.8	168.3
	Pratap (c)	205.0	133.8	136.1	131.8	151.7	145.6	151.6	123.7	161.4	145.6
	86 M 01(c)	204.8	134.3	138.6	130.0	151.9	154.4	186.8	156.8	176.0	168.5
	AHB 1269 (c)	205.4	132.9	136.4	132.3	151.7	151.3	180.3	156.2	181.1	167.2
	NHB 4903 (c)	205.9	133.9	135.5	129.3	151.1	160.4	182.2	167.8	189.6	175.0
	Kaveri Super Boss (c)	205.6	134.7	138.1	132.5	152.7	163.4	191.0	163.7	217.9	184.0
CD (5%)	**N**	NS	NS	NS	4.9		1.6	NS	3.6	8.3	
	E	1.3	1.2	NS	NS		1.3	21.0	3.1	8.1	
	N x E	2.7	NS	NS	NS		2.7	NS	6.5	NS	
	E x N	2.7	NS	NS	NS		2.9	NS	6.8	NS	
CV (%)		0.8	0.7	2.0	6.1		1.0	9.7	2.4	5.6	

Table II.9: PMAT 1b: Effect of N levels on days to 50% flowering and test weight of pearl millet medium and late advance hybrids and population entries in Zone B during kharif 2024

Treatment		Days to 50% flowering					Test weight (g)				
N(kg/ha)	Entries	ABD1	DHL	VYP	CBE	Mean	ABD1	DHL	VYP	CBE	Mean
0	MH 2682	58.0	-	50.0	44.0	50.7	10.5	-	10.7	10.6	10.6
	MH 2717	57.0	-	49.5	45.0	50.5	10.9	-	10.8	10.4	10.7
	AHB 1200 (c)	55.0	-	48.5	45.0	49.5	12.5	-	11.0	10.1	11.2
	86M86 (c)	58.0		49.5	44.0	50.5	11.7		10.6	11.2	11.2
	Pratap (c)	53.7	-	48.0	45.0	48.9	11.4	-	10.9	12.0	11.4
	86 M 01(c)	55.0	-	50.5	45.0	50.2	9.9	-	10.4	12.3	10.9
	AHB 1269 (c)	55.7	-	48.0	45.0	49.6	10.0	-	11.2	10.1	10.4
	NHB 4903 (c)	56.3	-	48.5	44.0	49.6	10.8	-	10.5	11.5	10.9
	Kaveri Super Boss (c)	58.0	-	50.5	46.0	51.5	10.0	-	10.9	12.8	11.2
	Mean	**56.3**	-	**49.2**	44.8	**50.1**	**10.9**	-	10.8	11.2	**10.9**
30	MH 2682	55.0	39.5	50.0	46.0	47.6	11.2	12.1	11.2	10.9	11.3
	MH 2717	55.0	40.5	49.5	46.0	47.8	11.4	12.2	11.2	10.6	11.3
	AHB 1200 (c)	53.0	40.0	48.5	47.0	47.1	13.2	11.9	11.6	10.3	11.8
	86M86 (c)	56.3	40.0	49.5	46.0	48.0	11.9	11.9	11.3	11.4	11.6
	Pratap (c)	53.0	41.0	47.5	46.0	46.9	11.8	11.8	11.0	12.2	11.7
	86 M 01(c)	54.0	41.0	50.0	47.0	48.0	10.5	11.8	11.2	12.7	11.5
	AHB 1269 (c)	55.0	38.5	47.5	44.0	46.3	10.4	12.0	11.6	10.3	11.0
	NHB 4903 (c)	54.0	40.5	48.5	46.0	47.3	11.1	11.8	11.3	11.8	11.5
	Kaveri Super Boss (c)	56.0	39.5	50.5	48.0	48.5	10.5	12.0	11.3	13.0	11.7
	Mean	**54.6**	**40.1**	**49.1**	**46.2**	**47.5**	**11.3**	**11.9**	**11.3**	**11.4**	**11.5**
60	MH 2682	54.0	40.5	49.0	47.0	47.6	11.8	12.2	11.4	11.1	11.6
	MH 2717	55.0	41.5	50.0	46.0	48.1	11.3	12.3	11.3	10.8	11.4
	AHB 1200 (c)	53.0	42.0	49.5	48.0	48.1	13.8	12.0	11.8	10.3	12.0
	86M86 (c)	57.0	43.5	50.5	48.0	49.8	12.9	11.9	11.7	11.7	12.1
	Pratap (c)	54.0	41.5	49.0	47.0	47.9	12.6	11.8	11.7	12.4	12.1
	86 M 01(c)	55.0	41.5	49.5	46.0	48.0	11.6	11.9	11.5	12.9	12.0
	AHB 1269 (c)	54.7	41.0	49.5	44.0	47.3	11.4	12.2	**11.9**	**10.3**	11.5
	NHB 4903 (c)	56.0	41.5	50.0	47.0	48.6	11.9	11.9	**11.2**	**12.0**	11.7
	Kaveri Super Boss (c)	56.3	41.5	51.5	49.0	49.6	11.6	12.1	**11.6**	**13.1**	12.1
	Mean	**55.0**	**41.6**	**49.8**	**46.9**	**48.3**	**12.1**	**12.0**	**11.6**	**11.6**	**11.8**
90	MH 2682	53.0	41.0	50.5	47.0	47.9	12.1	12.4	11.6	11.2	11.8
	MH 2717	52.3	44.5	50.0	47.0	48.5	11.5	12.5	11.7	10.9	11.7
	AHB 1200 (c)	53.7	45.0	49.5	48.0	49.0	14.1	12.1	12.2	10.4	12.2
	86M86 (c)	55.7	45.5	51.0	48.0	50.0	13.4	12.1	11.7	11.8	12.2
	Pratap (c)	52.0	43.5	49.5	47.0	48.0	12.9	11.9	11.6	12.6	12.2
	86 M 01(c)	54.0	43.5	50.0	46.0	48.4	12.5	12.0	11.4	13.1	12.2
	AHB 1269 (c)	54.0	42.0	50.0	44.0	47.5	11.9	12.3	11.9	10.5	11.6
	NHB 4903 (c)	53.7	42.5	50.5	47.0	48.4	12.3	12.0	11.3	12.2	12.0
	Kaveri Super Boss (c)	54.0	43.5	52.0	49.0	49.6	12.1	12.3	11.9	13.2	12.4
	Mean	**53.6**	**43.4**	**50.3**	**47.0**	**48.6**	**12.5**	**12.2**	**11.7**	**11.8**	**12.0**
Entries Mean	MH 2682	55.0	40.3	49.9	46.0	47.8	11.4	12.2	11.2	11.0	11.4
	MH 2717	54.8	42.2	49.8	46.0	48.2	11.3	12.3	11.2	10.7	11.4
	AHB 1200 (c)	53.7	42.3	49.0	47.0	48.0	13.4	12.0	11.6	10.3	11.8
	86M86 (c)	56.8	43.0	50.1	46.5	49.1	12.5	11.9	11.3	11.5	11.8
	Pratap (c)	53.2	42.0	48.5	46.3	47.5	12.2	11.8	11.3	12.3	11.9
	86 M 01(c)	54.5	42.0	50.0	46.0	48.1	11.1	11.9	11.2	12.7	11.7
	AHB 1269 (c)	54.8	40.5	48.8	44.3	47.1	10.9	12.1	11.6	10.3	11.2
	NHB 4903 (c)	55.0	41.5	49.4	46.0	48.0	11.5	11.9	11.1	11.9	11.6
	Kaveri Super Boss (c)	56.1	41.5	51.1	48.0	49.2	11.0	12.1	11.4	13.0	11.9
CD (5%)	**N**	0.8	2.0	0.3	1.2		0.3	0.0	0.2	0.1	
	E	0.9	1.4	0.5	1.2		0.5	0.1	0.3	0.1	
	N x E	NS	NS	1.1	NS		NS	NS	NS	NS	
	E x N	NS	NS	1.0	NS		NS	NS	NS	NS	
CV (%)		1.9	2.8	1.3	3.1		5.2	0.5	3.3	1.3	

Table II.10: PMAT 2a1: Effect of foliar application of nano urea on productivity, plant height and test weight of pearl millet in Zone A1 during *kharif* 2024

Treatments	Grain yield (q/ha)			Stover yield (q/ha)			Plant height (cm)			Test weight (g)		
	BKR	MDR	Mean	BKR	MDR	Mean	BKR	MDR	Mean	BKR	MDR	Mean
T_1 : Control (No nitrogen)	17.33	10.67	**14.00**	32.67	18.90	**25.78**	131.0	129.4	**130.2**	7.8	8.6	**8.2**
T_2 : RDN (½ at basal + ½ at 25-30 DAS)	25.23	19.13	**22.18**	49.57	38.43	**44.00**	151.0	160.2	**155.6**	7.9	8.9	**8.4**
T_3 : 75% RDN + foliar spray of urea @ 1.5% at 3 and 5 WAS	23.33	14.70	**19.02**	44.53	28.03	**36.28**	145.4	145.3	**145.4**	8.0	8.6	**8.3**
T_4 : 75% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 WAS	20.50	15.60	**18.05**	41.07	29.10	**35.08**	145.2	152.7	**149.0**	8.0	8.8	**8.4**
T_5 : 75% RDN + foliar spray of urea @ 2.5% at 3 and 5 WAS	23.77	15.33	**19.55**	47.43	26.77	**37.10**	150.7	147.5	**149.1**	8.0	8.7	**8.4**
T_6 : 75% RDN + foliar spray of nano urea @ 4 ml/l at 3-4 WAS	21.67	16.97	**19.32**	44.70	32.90	**38.80**	143.7	156.7	**150.2**	8.1	8.8	**8.5**
T_7 : 50% RDN + foliar spray of urea @ 1.5% at 3 and 5 WAS	20.13	12.63	**16.38**	40.37	23.13	**31.75**	144.5	138.8	**141.7**	8.0	8.9	**8.5**
T_8 : 50% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 WAS	15.83	13.33	**14.58**	38.43	24.87	**31.65**	137.8	140.2	**139.0**	8.1	8.9	**8.5**
T_9 : 50% RDN + foliar spray of urea @ 2.5 % at 3 and 5 WAS	18.73	12.87	**15.80**	38.27	23.97	**31.12**	141.7	139.8	**140.7**	8.1	9.0	**8.6**
T_{10}: 50% RDN + foliar spray of nano urea @ 4 ml/l at 3-4 WAS	19.00	14.07	**16.53**	36.67	26.43	**31.55**	137.2	142.8	**140.0**	8.0	8.9	**8.5**
CD at 5 %	3.33	2.88		7.33	6.01		NS	8.8		NS	NS	
CV (%)	9.4	11.5		10.3	12.7		5.3	3.5		3.0	2.8	

Table II.11: PMAT 2a1: Effect of foliar application of nano urea on yield attributes and economics of pearl millet in Zone A1 during *kharif* 2024

Treatments	Plant population ('000/ha)			Total tillers/plant			Effective tillers/plant			Mandor		
	BKR	MDR	Mean	BKR	MDR	Mean	BKR	MDR	Mean	Gross return (Rs/ha)	Net return (Rs/ha)	BC ratio
T_1 : Control (No nitrogen)	126.7	94.9	**110.8**	3.9	2.5	**3.2**	3.2	1.7	**2.5**	40285	16985	1.73
T_2 : RDN (½ at basal + ½ at 25-30 DAS)	131.1	99.6	**115.4**	5.3	4.1	**4.7**	4.5	3.4	**4.0**	75207	49707	2.95
T_3 : 75% RDN + foliar spray of urea @ 1.5% at 3 and 5 WAS	129.2	96.3	**112.8**	5.3	3.3	**4.3**	4.4	2.7	**3.6**	56810	31110	2.21
T_4 : 75% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 WAS	129.9	99.1	**114.5**	5.2	3.7	**4.4**	4.4	3.1	**3.7**	59865	33365	2.26
T_5 : 75% RDN + foliar spray of urea @ 2.5% at 3 and 5 WAS	128.9	97.3	**113.1**	5.3	3.5	**4.4**	4.5	2.9	**3.7**	57648	31948	2.24
T_6 : 75% RDN + foliar spray of nano urea @ 4 ml/l at 3-4 WAS	127.3	98.7	**113.0**	5.1	3.7	**4.4**	4.2	3.2	**3.7**	65923	38623	2.41
T_7 : 50% RDN + foliar spray of urea @ 1.5% at 3 and 5 WAS	127.3	94.7	**111.0**	4.2	2.9	**3.6**	3.5	2.0	**2.8**	48200	22800	1.90
T_8 : 50% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 WAS	127.7	95.0	**111.3**	4.8	3.1	**4.0**	4.0	2.3	**3.2**	51164	24964	1.96
T_9 : 50% RDN + foliar spray of urea @ 2.5 % at 3 and 5 WAS	128.6	95.9	**112.3**	4.0	3.0	**3.5**	3.3	2.2	**2.8**	49354	23854	1.94
T_{10}: 50% RDN + foliar spray of nano urea @ 4 ml/l at 3-4 WAS	127.2	95.6	**111.4**	4.7	3.2	**4.0**	3.9	2.5	**3.2**	54107	27107	2.00
CD at 5 %	NS	NS		NS	0.5		NS	0.5		11406	11406	0.44
CV (%)	4.8	2.2		17.1	9.3		18.1	10.8		11.8	22.0	11.7

Table II.12: PMAT 2a1: Effect of foliar application of nano urea on protein, N and P content in grain of pearl millet in Zone A1 during kharif 2024

Treatment	Protein content in grain (%)	N Content from grain (%)	P Content from grain (%)
T1 : Control (No nitrogen)	7.04	1.13	0.25
T2 : RDN (½ at basal + ½ at 25-30 DAS)	9.17	1.47	0.32
T3 : 75% RDN + foliar spray of urea @ 1.5% at 3 and 5 WAS	8.22	1.32	0.28
T4 : 75% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 WAS	8.62	1.38	0.30
T5 : 75% RDN + foliar spray of urea @ 2.5% at 3 and 5 WAS	8.28	1.33	0.29
T6 : 75% RDN + foliar spray of nano urea @ 4 ml/l at 3 -4 WAS	8.99	1.44	0.31
T7 : 50% RDN + foliar spray of urea @ 1.5% at 3 and 5 WAS	7.54	1.21	0.25
T8 : 50% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 WAS	8.03	1.29	0.27
T9 : 50% RDN + foliar spray of urea @ 2.5 % at 3 and 5 WAS	7.75	1.24	0.26
T10: 50% RDN + foliar spray of nano urea @ 4 ml/l at 3-4 WAS	8.12	1.30	0.28
CD at 5 %	0.71	0.11	0.01
CV (%)	5.0	5.0	2.32

Table II.13: PMAT 2a1: Effect of foliar application of nano urea on N and P content in fodder of pearl millet in Zone A1 during kharif 2024

Treatment	N Content from fodder (%)	P Content from fodder (%)
T1 : Control (No nitrogen)	0.72	0.16
T2 : RDN (½ at basal + ½ at 25-30 DAS)	1.14	0.23
T3 : 75% RDN + foliar spray of urea @ 1.5% at 3 and 5 WAS	0.98	0.20
T4 : 75% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 WAS	1.03	0.22
T5 : 75% RDN + foliar spray of urea @ 2.5% at 3 and 5 WAS	1.00	0.21
T6 : 75% RDN + foliar spray of nano urea @ 4 ml/l at 3 -4 WAS	1.07	0.20
T7 : 50% RDN + foliar spray of urea @ 1.5% at 3 and 5 WAS	0.79	0.18
T8 : 50% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 WAS	0.92	0.20
T9 : 50% RDN + foliar spray of urea @ 2.5 % at 3 and 5 WAS	0.89	0.19
T10: 50% RDN + foliar spray of nano urea @ 4 ml/l at 3-4 WAS	0.95	0.19
CD at 5 %	0.08	0.02
CV (%)	5.1	4.5

Table II.14: PMAT 2a: Effect of foliar application of nano urea on productivity, plant height and plant population of pearl millet in Zone A during *kharif* 2024

Treatment	Grain yield (q/ha)				Stover yield (q/ha)				Plant height (cm)				Plant population ('000/ha)			
	HSR	JMR	JPR	Mean	HSR	JMR	JPR	Mean	HSR	JMR	JPR	Mean	HSR	JMR	JPR	Mean
T_1 : Control (No nitrogen)	24.32	16.92	20.52	**20.59**	71.90	34.61	52.35	**52.95**	184.3	169.2	162.0	**171.8**	139.8	158.0	168.0	**155.3**
T_2 : RDN (½ at basal + ½ at 25-30 DAS)	39.71	31.30	25.38	**32.13**	115.44	48.23	60.50	**74.73**	217.7	195.9	172.0	**195.2**	141.4	161.5	170.7	**157.8**
T_3 : 75% RDN + foliar spray of urea @ 1.5% at 3 and 5 WAS	33.09	24.51	26.33	**27.98**	101.11	42.86	62.26	**68.74**	202.0	186.6	177.0	**188.5**	141.2	161.1	178.3	**160.2**
T_4 : 75% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 WAS	34.45	28.91	25.89	**29.75**	104.97	45.10	60.70	**70.26**	201.0	188.4	179.0	**189.5**	141.3	158.7	177.7	**159.2**
T_5 : 75% RDN + foliar spray of urea @ 2.5% at 3 and 5 WAS	35.19	25.98	27.35	**29.51**	106.65	43.03	64.42	**71.37**	207.7	187.4	177.7	**190.9**	141.2	161.8	179.7	**160.9**
T_6 : 75% RDN + foliar spray of nano urea @ 4 ml/l at 3- 4 WAS	35.87	30.16	27.56	**31.20**	107.93	46.16	64.86	**72.98**	213.3	189.5	188.0	**197.0**	142.3	159.4	181.0	**160.9**
T_7 : 50% RDN + foliar spray of urea @ 1.5% at 3 and 5 WAS	30.88	19.23	25.46	**25.19**	93.57	37.54	60.22	**63.78**	191.3	174.9	182.7	**183.0**	141.3	160.4	174.0	**158.6**
T_8 : 50% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 WAS	32.14	21.08	25.75	**26.32**	97.80	41.03	59.61	**66.15**	192.7	179.9	181.3	**184.6**	140.8	162.9	171.0	**158.2**
T_9 : 50% RDN + foliar spray of urea @ 2.5 % at 3 and 5 WAS	33.63	20.04	26.61	**26.76**	102.03	38.72	62.21	**67.65**	200.0	176.7	183.0	**186.6**	141.7	161.5	176.0	**159.7**
T_{10}: 50% RDN + foliar spray of nano urea @ 4 ml/l at 3 - 4 WAS	34.78	23.43	26.70	**28.30**	104.15	41.11	64.79	**70.02**	202.7	183.1	179.7	**188.5**	141.2	160.8	178.7	**160.2**
CD at 5 %	3.45	4.54	3.22		6.83	7.32	7.01		8.8	12.7	13.2		NS	NS	NS	
CV (%)	6.0	10.9	7.2		3.9	10.1	6.6		2.5	4.0	4.3		1.5	3.3	3.1	

Table II.15: PMAT 2a: Effect of foliar application of nano urea on total & effective tillers/plant, test weight, av. PK in soil after harvest of pearl millet in Zone A during *kharif* 2024

Treatment	Total tillers/plant				Effective tillers/plant				Test weight (g)				K in Grain (%)	K in Straw (%)	Av. P in soil (kg/ha)	Av. K in soil (kg/ha)
	HSR	JMR	JPR	Mean	HSR	JMR	JPR	Mean	HSR	JMR	JPR	Mean	HSR	HSR	HSR	HSR
T_1 : Control (No nitrogen)	1.7	3.5	3.9	**3.0**	1.3	1.8	1.4	**1.5**	9.8	9.6	9.8	**9.8**	0.23	1.55	21.96	153.4
T_2 : RDN (½ at basal + ½ at 25-30 DAS)	2.7	4.3	4.2	**3.8**	2.3	3.3	1.9	**2.5**	10.9	11.8	10.4	**11.0**	0.27	1.75	21.24	146.9
T_3 : 75% RDN + foliar spray of urea @ 1.5% at 3 and 5 WAS	2.3	3.9	4.4	**3.6**	1.6	2.7	2.1	**2.1**	10.3	10.7	10.3	**10.4**	0.25	1.71	21.52	148.7
T_4 : 75% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 WAS	2.4	4.1	4.2	**3.6**	1.7	3.0	2.4	**2.4**	10.5	11.3	10.3	**10.7**	0.26	1.72	21.47	147.8
T_5 : 75% RDN + foliar spray of urea @ 2.5% at 3 and 5 WAS	2.4	4.0	5.0	**3.8**	1.7	2.8	2.6	**2.3**	10.4	11.1	10.4	**10.6**	0.26	1.72	21.20	148.4
T_6 : 75% RDN + foliar spray of nano urea @ 4 ml/l at 3- 4 WAS	2.5	4.3	4.6	**3.8**	2.0	3.1	2.9	**2.7**	10.6	11.5	10.5	**10.9**	0.27	1.73	21.10	147.4
T_7 : 50% RDN + foliar spray of urea @ 1.5% at 3 and 5 WAS	2.1	3.7	4.4	**3.4**	1.4	2.1	2.0	**1.9**	10.0	9.9	10.4	**10.1**	0.24	1.70	21.78	148.9
T_8 : 50% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 WAS	2.2	3.7	4.4	**3.4**	1.5	2.2	2.2	**2.0**	10.2	10.1	10.4	**10.2**	0.24	1.70	21.61	148.4
T_9 : 50% RDN + foliar spray of urea @ 2.5 % at 3 and 5 WAS	2.2	3.6	4.6	**3.5**	1.6	2.0	2.6	**2.1**	10.1	10.0	10.5	**10.2**	0.25	1.71	21.64	148.7
T_{10}: 50% RDN + foliar spray of nano urea @ 4 ml/l at 3 - 4 WAS	2.4	3.8	4.7	**3.6**	1.7	2.3	2.8	**2.3**	10.3	10.3	10.4	**10.4**	0.25	1.71	21.30	147.6
CD at 5 %	0.5	0.5	NS		NS	0.4	0.5		NS	1.2	0.4		NS	0.06	NS	NS
CV (%)	12.3	7.0	11.0		19.9	9.1	12.4		3.4	6.5	2.1		6.5	1.9	5.5	1.8

Table II.16: PMAT 2a: Effect of foliar application of nano urea on N and P content of grain and fodder after harvesting of pearl millet in Zone A during kharif 2024

Treatment	N Content from grain (%)			P Content from grain (%)			N Content from fodder (%)			P Content from fodder (%)		
	HSR	JMR	Mean	HSR	JMR	Mean	HSR	JMR	Mean	HSR	JMR	Mean
T_1 : Control (No nitrogen)	1.18	1.40	1.29	0.34	0.27	0.31	0.44	0.94	0.69	0.17	0.19	0.18
T_2 : RDN (½ at basal + ½ at 25-30 DAS)	1.28	1.81	1.54	0.39	0.33	0.36	0.55	1.43	0.99	0.21	0.24	0.23
T_3 : 75% RDN + foliar spray of urea @ 1.5% at 3 and 5 WAS	1.23	1.59	1.41	0.36	0.30	0.33	0.50	1.12	0.81	0.18	0.22	0.20
T_4 : 75% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 WAS	1.25	1.69	1.47	0.37	0.32	0.35	0.52	1.28	0.90	0.19	0.24	0.21
T_5 : 75% RDN + foliar spray of urea @ 2.5% at 3 and 5 WAS	1.25	1.62	1.43	0.37	0.31	0.34	0.51	1.21	0.86	0.19	0.23	0.21
T_6 : 75% RDN + foliar spray of nano urea @ 4 ml/l at 3- 4 WAS	1.26	1.70	1.48	0.38	0.34	0.36	0.53	1.35	0.94	0.21	0.24	0.22
T_7 : 50% RDN + foliar spray of urea @ 1.5% at 3 and 5 WAS	1.21	1.52	1.37	0.35	0.27	0.31	0.46	0.98	0.72	0.18	0.20	0.19
T_8 : 50% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 WAS	1.22	1.56	1.39	0.34	0.29	0.32	0.47	1.05	0.76	0.19	0.21	0.20
T_9 : 50% RDN + foliar spray of urea @ 2.5 % at 3 and 5 WAS	1.23	1.53	1.38	0.36	0.28	0.32	0.48	1.04	0.76	0.20	0.21	0.20
T_{10}: 50% RDN + foliar spray of nano urea @ 4 ml/l at 3 - 4 WAS	1.24	1.57	1.41	0.36	0.30	0.33	0.49	1.07	0.78	0.21	0.22	0.21
CD at 5 %	0.05	0.16		NS	0.02		0.05	0.10		NS	0.02	
CV (%)	2.4	5.6		5.7	4.0		5.9	4.9		8.6	4.0	

Table II.17: PMAT 2a: Effect of foliar application of nano urea on economics and protein content of pearl millet in Zone A during kharif 2024

Treatment	Gross returns (Rs/ha)			Net returns (Rs/ha)			BC ratio			Protein content (%)		
	HSR	JMR	Mean	HSR	JMR	Mean	HSR	JMR	Mean	HSR	JMR	Mean
T_1 : Control (No nitrogen)	78219	45761	61990	27092	22416	24754	1.53	1.96	1.74	7.36	8.76	8.06
T_2 : RDN (½ at basal + ½ at 25-30 DAS)	127327	83073	105200	73005	58749	65877	2.34	3.42	2.88	7.98	11.33	9.65
T_3 : 75% RDN + foliar spray of urea @ 1.5% at 3 and 5 WAS	107091	65561	86326	53281	40840	47060	1.99	2.65	2.32	7.67	9.93	8.80
T_4 : 75% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 WAS	111433	76785	94109	56821	51250	54035	2.04	3.01	2.53	7.81	10.57	9.19
T_5 : 75% RDN + foliar spray of urea @ 2.5% at 3 and 5 WAS	113695	69253	91474	59788	44503	52146	2.11	2.80	2.45	7.81	10.12	8.96
T_6 : 75% RDN + foliar spray of nano urea @ 4 ml/l at 3- 4 WAS	115744	80016	97880	60232	53625	56929	2.09	3.03	2.56	7.88	10.65	9.26
T_7 : 50% RDN + foliar spray of urea @ 1.5% at 3 and 5 WAS	99782	51829	75806	46482	27352	36917	1.87	2.12	2.00	7.58	9.50	8.54
T_8 : 50% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 WAS	103920	56803	80361	49818	31512	40665	1.92	2.25	2.09	7.63	9.77	8.70
T_9 : 50% RDN + foliar spray of urea @ 2.5 % at 3 and 5 WAS	108692	53972	81332	55295	29466	42381	2.04	2.2	2.12	7.71	9.53	8.62
T_{10}: 50% RDN + foliar spray of nano urea @ 4 ml/l at 3 - 4 WAS	112135	62686	87410	57133	36539	46836	2.04	2.4	2.22	7.77	9.82	8.80
CD at 5 %	-	-		-	-		-	-		0.32	0.97	0.64
CV (%)	-	-		-	-		-	-		2.4	5.6	4.0

Table II.18: PMAT 2b: Effect of foliar application of nano urea on grain yield, dry fodder yield and plant population of pearl millet in Zone B during *kharif* 2024

Treatment	Grain yield (q/ha)					Stover yield (q/ha)					Plant population ('000/ha)				
	ABD1	DHL	VYP	CBE	Mean	ABD1	DHL	VYP	CBE	Mean	ABD1	DHL	VYP	CBE	Mean
T_1 : Control (No nitrogen)	16.57	19.29	15.15	19.01	17.51	37.13	35.20	46.88	24.77	36.00	213.94	129.4	135.0	123.0	150.3
T_2 : RDN (½ at basal + ½ at 25-30 DAS)	24.00	30.95	23.77	27.72	26.61	53.76	56.49	56.41	42.22	52.22	219.3	135.8	136.6	130.0	155.4
T_3 : 75% RDN + foliar spray of urea @ 1.5% at 3 and 5 WAS	23.60	27.83	20.99	27.11	24.88	54.52	50.79	51.78	41.17	49.57	215.4	135.1	136.1	133.0	154.9
T_4 : 75% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 WAS	23.86	28.13	20.18	30.78	25.74	55.12	51.34	50.93	45.69	50.77	216.62	135.2	137.0	131.7	155.1
T_5 : 75% RDN + foliar spray of urea @ 2.5% at 3 and 5 WAS	24.20	29.57	22.09	29.84	26.42	55.90	53.96	54.22	44.02	52.02	214.91	135.5	136.1	130.3	154.2
T_6 : 75% RDN + foliar spray of nano urea @ 4 ml/l at 3-4 WAS	27.05	26.55	20.84	31.12	26.39	62.48	48.46	52.50	47.09	52.63	216.13	135.1	140.0	131.3	155.7
T_7 : 50% RDN + foliar spray of urea @ 1.5% at 3 and 5 WAS	23.49	23.09	17.50	23.47	21.89	52.62	42.13	49.75	36.43	45.23	214.42	133.4	135.4	130.7	153.5
T_8 : 50% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 WAS	23.64	24.22	16.01	24.20	22.02	52.95	44.20	45.93	35.87	44.74	218.08	133.8	137.3	129.0	154.5
T_9 : 50% RDN + foliar spray of urea @ 2.5 % at 3 and 5 WAS	23.83	25.51	21.19	24.60	23.78	53.38	46.56	52.29	35.80	47.01	213.21	134.5	134.0	128.3	152.5
T_{10}: 50% RDN + foliar spray of nano urea @ 4 ml/l at 3-4 WAS	26.56	22.30	19.96	25.72	23.63	59.49	40.69	51.78	38.58	47.64	215.64	133.3	138.2	128.0	153.8
CD at 5 %	4.48	3.63	3.23	4.35		10.09	6.62	NS	5.87		3.42	2.1	NS	5.1	
CV (%)	10.9	8.2	9.4	9.5		10.9	8.2	9.8	8.7		0.92	0.9	2.1	2.3	

Table II.19: PMAT 2b: Effect of foliar application of nano urea on protein content, N and P content from grain and fodder after harvesting of pearl millet in Zone B during *kharif* 2024

Treatment	Protein content (%)				N Content from grain(%)				P Content from grain (%)				N Content from fodder (%)				P Content from fodder (%)			
	DHL	VYP	CBE	Mean	DHL	VYP	CBE	Mean	DHL	VYP	CBE	Mean	DHL	VYP	CBE	Mean	DHL	VYP	CBE	Mean
T_1 : Control (No nitrogen)	9.6	11.2	9.3	10.0	1.54	1.79	1.16	1.50	0.47	0.27	0.21	0.32	0.99	0.38	0.50	0.62	0.30	0.08	0.12	0.17
T_2 : RDN (½ at basal + ½ at 25-30 DAS)	9.8	13.0	11.8	11.6	1.57	2.09	1.60	1.75	0.48	0.31	0.27	0.35	1.03	0.47	0.56	0.69	0.31	0.14	0.17	0.21
T_3 : 75% RDN + foliar spray of urea @ 1.5% at 3 and 5 WAS	9.8	13.2	11.9	11.6	1.57	2.11	1.63	1.77	0.48	0.30	0.27	0.35	1.03	0.47	0.55	0.68	0.31	0.10	0.17	0.20
T_4 : 75% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 WAS	9.9	12.8	12.2	11.6	1.58	2.05	1.71	1.78	0.48	0.28	0.28	0.35	1.04	0.42	0.58	0.68	0.31	0.10	0.19	0.20
T_5 : 75% RDN + foliar spray of urea @ 2.5% at 3 and 5 WAS	9.9	13.2	12.2	11.8	1.58	2.12	1.69	1.79	0.48	0.32	0.28	0.36	1.04	0.48	0.58	0.70	0.31	0.12	0.18	0.21
T_6 : 75% RDN + foliar spray of nano urea @ 4 ml/l at 3-4 WAS	9.9	12.8	12.4	11.7	1.59	2.06	1.73	1.79	0.48	0.30	0.28	0.36	1.06	0.42	0.59	0.69	0.32	0.12	0.19	0.21
T_7 : 50% RDN + foliar spray of urea @ 1.5% at 3 and 5 WAS	9.8	12.3	11.4	11.2	1.56	1.98	1.27	1.60	0.48	0.25	0.25	0.33	1.02	0.42	0.51	0.65	0.31	0.10	0.14	0.18
T_8 : 50% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 WAS	9.8	12.1	11.6	11.1	1.56	1.93	1.42	1.64	0.48	0.28	0.25	0.34	1.02	0.38	0.52	0.64	0.31	0.09	0.15	0.18
T_9 : 50% RDN + foliar spray of urea @ 2.5 % at 3 and 5 WAS	9.8	12.8	11.5	11.3	1.56	2.04	1.43	1.68	0.48	0.29	0.26	0.34	1.02	0.43	0.53	0.66	0.31	0.11	0.15	0.19
T_{10}: 50% RDN + foliar spray of nano urea @ 4 ml/l at 3- 4 WAS	9.8	12.3	11.8	11.3	1.57	1.97	1.51	1.68	0.48	0.30	0.26	0.35	1.03	0.43	0.53	0.66	0.31	0.12	0.16	0.20
CD at 5 %	NS	1.2	0.5		NS	0.19	0.16		NS	NS	0.02		NS	NS	0.02		NS	NS	0.02	
CV (%)	2.5	5.4	2.7		6.4	5.4	6.0		7.7	18.8	4.7		5.0	15.7	2.2		9.7	23.7	7.2	

Table II.20: PMAT 2b: Effect of foliar application of nano urea on yield attributes of pearl millet in Zone B during *kharif* 2024

Treatment	Total tillers/plant					Effective tillers/plant					Test weight (g)					Plant height (cm)				
	ABD1	DHL	VYP	CBE	Mean	ABD1	DHL	VYP	CBE	Mean	ABD1	DHL	VYP	CBE	Mean	ABD1	DHL	VYP	CBE	Mean
T_1 : Control (No nitrogen)	2.6	3.3	2.9	3.0	2.9	1.8	1.9	2.2	2.1	2.0	13.2	11.5	10.9	9.8	11.3	171.6	181.3	167.6	141.3	165.5
T_2 : RDN (½ at basal + ½ at 25-30 DAS)	3.7	4.5	3.6	4.0	3.9	2.7	3.0	2.7	2.9	2.8	14.6	12.2	12.0	12.0	12.7	182.4	200.7	183.5	172.4	184.7
T_3 : 75% RDN + foliar spray of urea @ 1.5% at 3 and 5 WAS	3.3	4.2	3.5	3.9	3.7	2.3	3.0	2.7	3.0	2.7	14.3	12.0	11.6	11.9	12.5	184.7	198.6	179.3	170.5	183.3
T_4 : 75% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 WAS	3.7	4.3	3.3	4.2	3.9	2.7	3.0	2.5	3.5	2.9	14.3	12.1	11.1	13.3	12.7	188.4	198.7	175.2	179.5	185.4
T_5 : 75% RDN + foliar spray of urea @ 2.5% at 3 and 5 WAS	3.8	4.3	3.5	4.1	3.9	2.8	3.0	2.7	3.3	3.0	14.3	12.1	12.0	13.0	12.9	185.5	198.7	181.8	173.4	184.8
T_6 : 75% RDN + foliar spray of nano urea @ 4 ml/l at 3-4 WAS	4.4	4.2	3.5	4.4	4.1	3.4	3.0	2.6	3.8	3.2	14.7	12.0	11.7	13.6	13.0	191.5	198.5	177.6	183.6	187.8
T_7 : 50% RDN + foliar spray of urea @ 1.5% at 3 and 5 WAS	3.0	4.2	3.1	3.5	3.5	2.1	2.9	2.4	2.3	2.4	13.1	11.9	11.3	10.9	11.8	181.5	197.7	170.4	146.4	174.0
T_8 : 50% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 WAS	3.4	4.2	3.0	3.7	3.6	2.5	3.0	2.2	2.6	2.6	13.3	12.0	11.0	11.2	11.9	181.9	198.0	168.4	153.4	175.4
T_9 : 50% RDN + foliar spray of urea @ 2.5 % at 3 and 5 WAS	3.5	4.2	3.2	3.6	3.6	2.6	3.0	2.4	2.5	2.6	13.3	12.0	11.4	11.1	11.9	190.6	198.3	174.6	152.3	179.0
T_{10}: 50% RDN + foliar spray of nano urea @ 4 ml/l at 3- 4 WAS	4.0	4.1	3.1	3.8	3.8	3.1	2.9	2.3	2.67	2.7	13.4	11.9	11.6	11.6	12.1	188.4	196.8	171.3	162.4	179.8
CD at 5 %	0.5	0.6	0.3	0.3		0.5	0.1	0.3	0.3		NS	0.3	NS	0.5		NS	5.6	9.2	12.0	
CV (%)	8.3	7.9	5.5	4.8		10.6	3.0	7.4	5.3		6.0	1.6	6.7	2.6		3.6	1.6	3.1	4.3	

Table II.21: PMAT 2b: Effect of foliar application of nano urea on economics of pearl millet in Zone B during *kharif* 2024

Treatment	Gross returns (Rs/ha)					Net returns (Rs/ha)					B:C				
	ABD1	DHL	VYP	CBE	Mean	ABD1	DHL	VYP	CBE	Mean	ABD1	DHL	VYP	CBE	Mean
T_1 : Control (No nitrogen)	56327	51033	35593	47570	47631	28827	22707	21277	10526	20834	2.05	1.80	2.49	1.28	1.90
T_2 : RDN (½ at basal + ½ at 25-30 DAS)	81555	81903	55862	69372	72173	50055	51809	38885	29684	42608	2.59	2.72	3.29	1.75	2.59
T_3 : 75% RDN + foliar spray of urea @ 1.5% at 3 and 5 WAS	80527	73641	49323	67845	67834	49727	42797	31425	27711	37915	2.61	2.39	2.75	1.69	2.36
T_4 : 75% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 WAS	81417	74672	47413	77027	70132	51017	44090	28322	36143	39893	2.68	2.44	2.48	1.88	2.37
T_5 : 75% RDN + foliar spray of urea @ 2.5% at 3 and 5 WAS	82564	78014	51918	74658	71789	51564	47064	33917	34506	41763	2.66	2.52	2.88	1.86	2.48
T_6 : 75% RDN + foliar spray of nano urea @ 4 ml/l at 3 -4 WAS	92283	70134	48991	77862	72318	62083	39072	30400	37978	42383	3.06	2.26	2.64	1.95	2.48
T_7 : 50% RDN + foliar spray of urea @ 1.5% at 3 and 5 WAS	79816	61144	41114	58721	60199	50016	30492	23454	17578	30385	2.68	2.00	2.33	1.43	2.11
T_8 : 50% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 WAS	80313	64190	37633	60554	60672	50913	33800	18780	19138	30658	2.73	2.11	2.00	1.46	2.08
T_9 : 50% RDN + foliar spray of urea @ 2.5 % at 3 and 5 WAS	80975	67215	49785	61562	64885	50975	36457	32022	20439	34973	2.70	2.19	2.80	1.50	2.30
T_{10}: 50% RDN + foliar spray of nano urea @ 4 ml/l at 3 -4 WAS	90249	58009	46891	64350	64875	61049	27139	28538	23934	35165	3.09	1.88	2.55	1.59	2.28
CD at 5 %	15232	9666	7697	-		15232	9666	7697	-		0.5	0.3	0.4	-	
CV (%)	10.9	8.2	9.6	-		17.4	14.9	15.5	-		10.8	8.1	9.9	-	

Table II.22: PMAT 2b: Effect of foliar application of nano urea on physio-chemical properties of soil after harvesting of pearl millet crop in Zone B during *kharif* 2024

Treatment	Soil status after harvest											
	OC (%)	pH	EC	Available N (kg/ha)			Available P (kg/ha)			Available K (kg/ha)		
	DHL	DHL	DHL	DHL	VYP	Mean	DHL	VYP	Mean	DHL	VYP	Mean
T_1 : Control (No nitrogen)	0.46	8.21	0.41	176.0	189.5	182.8	15.5	23.7	19.6	480	415	447
T_2 : RDN (½ at basal + ½ at 25-30 DAS)	0.48	8.19	0.43	202.0	177.1	189.6	15.7	20.3	18.0	474	388	431
T_3 : 75% RDN + foliar spray of urea @ 1.5% at 3 and 5 WAS	0.48	8.20	0.42	198.0	181.5	189.8	15.7	21.9	18.8	476	394	435
T_4 : 75% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 WAS	0.48	8.20	0.42	196.0	183.0	189.5	15.7	22.8	19.2	476	414	445
T_5 : 75% RDN + foliar spray of urea @ 2.5% at 3 and 5 WAS	0.48	8.20	0.42	198.0	178.6	188.3	15.7	22.5	19.1	476	406	441
T_6 : 75% RDN + foliar spray of nano urea @ 4 ml/l at 3 -4 WAS	0.48	8.20	0.42	198.0	180.2	189.1	15.7	21.2	18.4	475	397	436
T_7 : 50% RDN + foliar spray of urea @ 1.5% at 3 and 5 WAS	0.47	8.21	0.41	182.0	184.8	183.4	15.7	21.8	18.8	479	409	444
T_8 : 50% RDN + foliar spray of nano urea @ 2 ml/l at 3 and 5 WAS	0.48	8.21	0.41	178.0	178.5	178.2	15.7	23.5	19.6	479	415	447
T_9 : 50% RDN + foliar spray of urea @ 2.5 % at 3 and 5 WAS	0.47	8.21	0.41	180.0	182.3	181.2	15.7	23.2	19.4	478	414	446
T_{10}: 50% RDN + foliar spray of nano urea @ 4 ml/l at 3 -4 WAS	0.47	8.21	0.41	180.0	185.5	182.7	15.7	22.4	19.1	478	403	441
CD at 5 %	-	-	-	-	NS		-	NS		-	NS	
CV (%)	-	-	-	-	4.0		-	6.5		-	5	
Initial value (Dhule)	0.48	8.20	0.41	206.0	-		15.2	-		472	-	

Table II.23: PMAT 3A1: Effect of foliar application of nano DAP on grain yield, stover yield and plant height of pearl millet in Zone A1 during *kharif* 2024

Treatment	Grain yield (q/ha)			Stover yield (q/ha)			Plant height (cm)		
	BKR	MDR	Mean	BKR	MDR	Mean	BKR	MDR	Mean
T_1 : Control	19.53	11.60	**15.57**	47.33	20.60	**33.97**	130.0	133.0	**131.5**
T_2 : RDP	28.23	20.23	**24.23**	71.37	40.53	**55.95**	152.9	163.5	**158.2**
T_3 : 75% RDP + seed treatment of nano DAP 5 ml/kg seed	23.97	15.43	**19.70**	68.47	29.30	**48.88**	148.8	157.6	**153.2**
T_4 : 50% RDP + seed treatment of nano DAP 5 ml/kg seed	21.00	13.77	**17.38**	62.63	25.73	**44.18**	147.0	155.0	**151.0**
T_5 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 WAS	24.90	16.00	**20.45**	70.47	27.97	**49.22**	153.3	158.2	**155.8**
T_6 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 WAS	23.97	16.57	**20.27**	73.33	30.87	**52.10**	150.7	159.9	**155.3**
T_7 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 WAS	24.47	17.37	**20.92**	70.37	31.80	**51.08**	154.6	160.7	**157.7**
T_8 : T_4 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 WAS	24.20	14.23	**19.22**	62.70	26.70	**44.70**	143.2	155.6	**149.4**
T_9 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 WAS	25.33	18.03	**21.68**	70.53	33.57	**52.05**	151.6	161.4	**156.5**
T_{10}: T_4 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 WAS	23.33	14.60	**18.97**	60.47	27.40	**43.93**	146.3	156.4	**151.4**
CD at 5 %	NS	3.01		12.15	5.79		8.6	7.7	
CV (%)	18.6	11.0		10.7	11.4		3.4	2.9	

Table II.24: PMAT 3A1: Effect of foliar application of nano DAP on plant population, total and effective tillers/plant of pearl millet in Zone A1 during *kharif* 2024

Treatment	Plant population ('000/ha)			Total tillers/plant			Effective tillers/plant		
	BKR	MDR	Mean	BKR	MDR	Mean	BKR	MDR	Mean
T_1 : Control	129.6	97.6	**113.6**	3.4	2.6	**3.0**	3.0	1.8	**2.4**
T_2 : RDP	134.7	103.3	**119.0**	5.9	4.2	**5.0**	5.2	3.6	**4.4**
T_3 : 75% RDP + seed treatment of nano DAP 5 ml/kg seed	132.3	98.1	**115.2**	4.9	3.5	**4.2**	4.3	2.7	**3.5**
T_4 : 50% RDP + seed treatment of nano DAP 5 ml/kg seed	132.9	97.7	**115.3**	4.7	3.1	**3.9**	4.1	2.4	**3.3**
T_5 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 WAS	132.2	98.7	**115.4**	5.5	3.6	**4.5**	4.8	2.9	**3.9**
T_6 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 WAS	130.4	99.2	**114.8**	5.2	3.7	**4.4**	4.5	3.0	**3.8**
T_7 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 WAS	130.5	100.4	**115.4**	4.5	3.8	**4.2**	3.9	3.1	**3.5**
T_8 : T_4 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 WAS	130.8	97.9	**114.3**	4.9	3.2	**4.0**	4.3	2.4	**3.3**
T_9 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 WAS	131.7	102.7	**117.2**	5.0	3.9	**4.4**	4.4	3.3	**3.8**
T_{10}: T_4 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 WAS	130.3	98.1	**114.2**	4.5	3.4	**4.0**	4.0	2.5	**3.2**
CD at 5 %	NS	3.3		1.0	0.4		0.9	0.4	
CV (%)	5.3	1.9		12.1	6.9		12.2	8.2	

Table II.25: PMAT 3A1: Effect of foliar application of nano DAP on test weight, protein content, N and P content in grain of pearl millet in Zone A1 during *kharif* 2024

Treatments	Test weight (g)			Mandor		
	BKR	MDR	Mean	Protein content in grain (%)	N Content grain (%)	P Content grain (%)
T_1 : Control	7.9	8.7	**8.3**	7.06	1.13	0.24
T_2 : RDP	8.3	8.9	**8.6**	9.25	1.48	0.33
T_3 : 75% RDP + seed treatment of nano DAP 5 ml/kg seed	8.3	8.7	**8.5**	8.13	1.30	0.28
T_4 : 50% RDP + seed treatment of nano DAP 5 ml/kg seed	8.2	8.8	**8.5**	7.92	1.27	0.26
T_5 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 weeks after sowing	8.2	8.7	**8.5**	8.25	1.32	0.28
T_6 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 weeks after sowing	8.3	8.8	**8.6**	8.61	1.38	0.29
T_7 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 weeks after sowing	8.3	8.9	**8.6**	8.66	1.39	0.30
T_8 : T_4 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 weeks after sowing	8.3	8.9	**8.6**	7.61	1.22	0.27
T_9 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 weeks after sowing	8.2	9.0	**8.6**	8.98	1.44	0.31
T_{10}: T_4 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 weeks after sowing	8.3	8.8	**8.5**	8.03	1.28	0.27
CD at 5 %	NS	NS		0.90	0.144	0.01
CV (%)	2.8	1.8		6.3	6.3	2.88

Table II.26: PMAT 3A1: Effect of foliar application of nano DAP on N and P content of fodder and economics of pearl millet in Mandor centre (Zone A1) during kharif 2024

Treatments	Mandor				
	N Content fodder (%)	P Content fodder (%)	Gross return (Rs/ha)	Net return (Rs/ha)	BC ratio
T_1 : Control	0.60	0.16	43840	20540	1.88
T_2 : RDP	0.99	0.23	79459	53959	3.12
T_3 : 75% RDP + seed treatment of nano DAP 5 ml/kg seed	0.76	0.20	59558	33858	2.32
T_4 : 50% RDP + seed treatment of nano DAP 5 ml/kg seed	0.69	0.19	52865	26365	2.00
T_5 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 weeks after sowing	0.77	0.20	60178	34478	2.34
T_6 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 weeks after sowing	0.79	0.21	63551	36251	2.33
T_7 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 weeks after sowing	0.82	0.21	66258	40858	2.61
T_8 : T_4 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 weeks after sowing	0.72	0.18	54718	28518	2.09
T_9 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 weeks after sowing	0.86	0.22	69156	43656	2.71
T_{10}: T_4 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 weeks after sowing	0.74	0.19	56135	29135	2.08
CD at 5 %	0.09	0.01	11607	11607	0.44
CV (%)	7.1	3.1	11.1	19.3	10.9

Table II.27: PMAT 3A: Effect of foliar application of nano DAP on grain yield, stover yield and plant height of pearl millet in Zone A during *kharif* 2024

Treatment	Grain yield (q/ha)				Stover yield (q/ha)				Plant height (cm)			
	HSR	JMR	JPR	Mean	HSR	JMR	JPR	Mean	HSR	JMR	JPR	Mean
T_1 : Control	20.54	14.20	23.65	19.46	70.67	27.49	56.40	51.52	190.7	175.5	164.0	176.7
T_2 : RDP	37.12	24.71	25.13	28.99	114.87	41.33	59.97	72.06	214.7	198.1	177.7	196.8
T_3 : 75% RDP + seed treatment of nano DAP 5 ml/kg seed	30.61	19.38	26.37	25.45	102.32	32.26	62.82	65.80	205.7	185.1	179.0	189.9
T_4 : 50% RDP + seed treatment of nano DAP 5 ml/kg seed	27.92	17.30	26.39	23.87	96.47	29.28	63.14	62.96	200.0	181.9	179.7	187.2
T_5 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 weeks after sowing	31.90	19.64	27.76	26.44	105.13	33.56	66.29	68.33	208.0	188.2	179.7	192.0
T_6 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 weeks after sowing	32.92	20.16	27.56	26.88	107.05	35.63	65.57	69.42	210.0	189.3	180.0	193.1
T_7 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 WAS	33.16	21.96	30.19	28.44	108.30	37.43	72.12	72.62	211.7	191.5	184.7	195.9
T_8 : T_4 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 WAS	29.91	17.61	29.45	25.66	100.73	29.83	70.15	66.90	205.0	183.1	183.3	190.5
T_9 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 WAS	33.29	24.41	30.93	29.55	109.04	39.14	73.51	73.90	212.3	194.8	185.0	197.4
T_{10}: T_4 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 WAS	31.02	18.59	30.78	26.80	103.80	30.49	73.56	69.28	207.7	183.5	189.0	193.4
CD at 5 %	3.50	4.92	4.31		6.32	6.06	8.41		6.78	12.44	NS	
CV (%)	6.6	14.4	9.0		3.6	10.4	7.3		1.9	3.8	4.2	

Table II.28: PMAT 3A: Effect of foliar application of nano DAP on total tillers/plant, effective tillers/plant and test weight of pearl millet in Zone A during kharif 2024

Treatment	Total tillers/plant				Effective tillers/plant				Test weight (g)			
	HSR	JMR	JPR	Mean	HSR	JMR	JPR	Mean	HSR	JMR	JPR	Mean
T_1 : Control	2.7	3.3	3.7	3.2	1.7	2.0	1.6	1.7	10.0	9.1	9.7	9.6
T_2 : RDP	3.3	4.1	4.0	3.8	2.8	3.1	1.6	2.5	11.3	11.4	10.1	10.9
T_3 : 75% RDP + seed treatment of nano DAP 5 ml/kg seed	2.8	3.6	4.7	3.7	2.4	2.5	2.0	2.3	10.6	10.0	9.7	10.1
T_4 : 50% RDP + seed treatment of nano DAP 5 ml/kg seed	2.4	3.4	4.1	3.3	2.0	2.3	1.9	2.1	10.4	9.4	9.8	9.8
T_5 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 weeks after sowing	2.9	3.7	4.2	3.6	2.4	2.7	1.9	2.4	10.6	10.2	9.9	10.3
T_6 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 weeks after sowing	2.8	3.8	4.7	3.8	2.5	2.8	2.0	2.4	10.8	10.4	9.9	10.4
T_7 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 WAS	3.0	3.9	4.8	3.9	2.6	2.9	2.9	2.8	10.6	10.9	10.0	10.5
T_8 : T_4 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 WAS	2.7	3.5	4.7	3.6	2.3	2.4	2.5	2.4	10.3	9.5	10.0	9.9
T_9 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 WAS	3.1	4.0	4.9	4.0	2.6	3.0	2.8	2.8	10.8	11.2	10.3	10.8
T_{10}: T_4 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 WAS	3.0	3.5	4.8	3.8	2.4	2.5	2.8	2.6	10.5	9.8	10.0	10.1
CD at 5 %	NS	0.4	0.7		0.5	0.4	0.5		0.5	1.1	NS	
CV (%)	14.4	6.5	9.2		12.3	9.8	13.1		2.6	6.1	2.7	

Table II.29: PMAT 3A: Effect of foliar application of nano DAP on economics of pearl millet in Zone A during *kharif* 2024

Treatment	Gross returns (Rs/ha)			Net returns (Rs/ha)			BC ratio		
	HSR	JMR	Mean	HSR	JMR	Mean	HSR	JMR	Mean
T_1 : Control	68052	38249	53150	17350	17479	17414	1.34	1.84	1.59
T_2 : RDP	120415	65908	93161	66093	41773	53933	2.22	2.73	2.47
T_3 : 75% RDP + seed treatment of nano DAP 5 ml/kg seed	100816	51676	76246	47946	28087	38016	1.91	2.19	2.05
T_4 : 50% RDP + seed treatment of nano DAP 5 ml/kg seed	92585	46178	69381	40643	23157	31900	1.78	2.01	1.90
T_5 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 WAS	104764	52456	78610	49514	27139	38327	1.90	2.07	1.98
T_6 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 WAS	107832	53963	80898	50782	27218	39000	1.89	2.02	1.96
T_7 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 WAS	108706	58643	83674	51076	31598	41337	1.89	2.17	2.03
T_8 : T_4 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 WAS	98667	47008	72838	41935	20531	31233	1.74	1.78	1.76
T_9 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 WAS	109194	64939	87067	47964	35038	41501	1.78	2.17	1.98
T_{10}: T_4 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 WAS	102180	49524	75852	41848	20191	31019	1.69	1.69	1.69

Table II.30: PMAT 3A: Effect of foliar application of nano DAP on protein content, N and P content in grain of pearl millet in Zone A during kharif 2024

Treatment	Protein content (%)			N Content in grain (%)			P Content in grain (%)		
	HSR	JMR	Mean	HSR	JMR	Mean	HSR	JMR	Mean
T_1 : Control	8.67	8.92	8.79	1.39	1.37	1.38	0.33	0.26	0.30
T_2 : RDP	9.38	10.70	10.04	1.50	1.65	1.57	0.38	0.34	0.36
T_3 : 75% RDP + seed treatment of nano DAP 5 ml/kg seed	8.92	9.67	9.30	1.43	1.49	1.46	0.36	0.30	0.33
T_4 : 50% RDP + seed treatment of nano DAP 5 ml/kg seed	8.73	9.15	8.94	1.40	1.41	1.40	0.33	0.28	0.31
T_5 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 WAS	9.02	9.72	9.37	1.44	1.50	1.47	0.37	0.31	0.34
T_6 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 WAS	9.08	9.80	9.44	1.45	1.51	1.48	0.38	0.31	0.35
T_7 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 WAS	9.11	10.39	9.75	1.46	1.60	1.53	0.38	0.32	0.35
T_8 : T_4 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 WAS	8.88	9.24	9.06	1.42	1.42	1.42	0.35	0.29	0.32
T_9 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 WAS	9.19	10.55	9.87	1.47	1.62	1.55	0.38	0.33	0.36
T_{10}: T_4 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 WAS	8.94	9.48	9.21	1.43	1.46	1.44	0.36	0.29	0.32
CD at 5 %	0.26	0.59		0.04	0.09		0.03	0.02	
CV (%)	1.7	3.5		1.7	3.5		4.3	3.7	

Table II.31: PMAT 3A: Effect of foliar application of nano DAP on plant population, N, P & K content in fodder, K content in grain, Av. P and K in soil after harvesting of pearl millet in Zone A during kharif 2024

Treatment	N Content fodder (%)			P Content fodder (%)			K in Grain (%)	K in fodder (%)	Av. P in soil (%)	Av. K in soil (%)	Plant population ('000/ha)			
	HSR	JMR	Mean	HSR	JMR	Mean	HSR (After harvest of pearl millet)				HSR	JMR	JPR	Mean
T_1 : Control	0.34	1.01	0.67	0.18	0.19	0.19	0.23	1.52	20.20	174.8	138.2	158.0	174.7	156.9
T_2 : RDP	0.42	1.36	0.89	0.23	0.25	0.24	0.31	1.73	21.80	176.6	141.3	161.5	172.0	158.3
T_3 : 75% RDP + seed treatment of nano DAP 5 ml/kg seed	0.37	1.15	0.76	0.19	0.21	0.20	0.27	1.68	20.77	174.3	140.8	161.1	184.3	162.1
T_4 : 50% RDP + seed treatment of nano DAP 5 ml/kg seed	0.33	1.02	0.67	0.16	0.19	0.18	0.25	1.65	20.57	174.6	140.5	158.7	183.0	160.7
T_5 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 WAS	0.39	1.22	0.81	0.20	0.22	0.21	0.28	1.69	20.97	174.3	140.8	161.8	184.3	162.3
T_6 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 WAS	0.40	1.30	0.85	0.21	0.23	0.22	0.29	1.70	21.13	174.1	142.2	159.4	182.3	161.3
T_7 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 WAS	0.40	1.31	0.85	0.22	0.23	0.22	0.30	1.70	21.17	174.0	141.5	160.4	186.0	162.6
T_8 : T_4 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 WAS	0.35	1.03	0.69	0.20	0.19	0.19	0.26	1.66	20.80	174.5	141.2	162.9	174.7	159.6
T_9 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 WAS	0.40	1.35	0.88	0.22	0.24	0.23	0.30	1.70	21.30	174.1	141.3	161.5	183.3	162.0
T_{10}: T_4 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 WAS	0.36	1.05	0.70	0.21	0.20	0.20	0.27	1.67	20.97	174.4	141.2	160.8	180.3	160.8
CD at 5 %	0.04	0.08		0.04	0.01		0.04	0.05	NS	NS	NS	NS	NS	
CV (%)	5.9	4.1		10.7	3.9		8.4	1.8	3.7	1.7	1.3	3.3	3.4	

Table II.32: PMAT 3B: Effect of foliar application of nano DAP on grain yield, stover yield and plant population of pearl millet in Zone B during *kharif* 2024

Treatments	Grain yield (q/ha)					Stover yield (q/ha)					Plant population ('000/ha)				
	ABD1	DHL	VYP	CBE	Mean	ABD1	DHL	VYP	CBE	Mean	ABD1	DHL	VYP	CBE	Mean
T_1 : Control	16.08	18.06	17.79	22.33	18.57	34.84	33.47	54.82	33.42	39.14	215.5	129.3	133.8	125.7	151.1
T_2 : RDP	26.93	30.78	22.17	30.63	27.63	58.48	57.04	62.41	46.74	56.17	217.8	135.2	133.1	142.7	157.2
T_3 : 75% RDP + seed treatment of nano DAP 5 ml/kg seed	23.63	26.40	19.83	27.00	24.22	50.44	48.92	59.35	39.65	49.59	214.8	134.6	136.1	134.0	154.9
T_4 : 50% RDP + seed treatment of nano DAP 5 ml/kg seed	22.42	22.68	18.82	25.74	22.41	48.24	42.03	57.71	37.37	46.34	215.2	132.8	132.6	133.0	153.4
T_5 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 WAS	24.15	27.10	20.19	31.09	25.63	52.14	50.21	62.89	47.81	53.27	215.6	134.8	135.6	143.0	157.3
T_6 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 WAS	25.71	28.42	20.89	28.69	25.93	55.19	52.66	63.19	43.98	53.76	214.7	134.9	134.3	138.3	155.5
T_7 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 WAS	24.59	29.13	22.21	31.93	26.97	52.27	53.98	61.04	48.44	53.93	214.2	135.0	138.7	143.3	157.8
T_8 : T_4 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 WAS	23.03	24.79	21.34	27.77	24.23	56.28	45.93	58.66	41.38	50.56	217.1	133.7	133.8	135.7	155.1
T_9 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 WAS	26.75	23.64	24.68	31.99	26.77	57.02	43.81	62.75	48.92	53.12	215.9	133.3	138.7	144.3	158.1
T_{10}: T_4 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 WAS	24.37	25.58	22.11	28.53	25.15	50.20	47.39	59.91	42.92	50.11	217.1	134.0	136.3	137.0	156.1
CD at 5 %	5.20	4.89	NS	3.57		9.86	9.06	NS	4.76		NS	2.0	NS	7.8	
CV (%)	12.7	11.0	12.2	7.2		11.1	11.0	7.3	6.4		0.9	0.9	2.5	3.3	

Table II.33: PMAT 3B: Effect of foliar application of nano DAP on total tillers/plant, effective tillers/plant and test weight of pearl millet in Zone B during *kharif* 2024

Treatments	Total tillers/plant					Effective tillers/plant					Test weight (g)				
	ABD1	DHL	VYP	CBE	Mean	ABD1	DHL	VYP	CBE	Mean	ABD1	DHL	VYP	CBE	Mean
T_1 : Control	3.7	3.3	3.1	3.2	3.3	2.7	2.1	2.6	3.1	2.6	13.5	11.6	11.3	11.4	11.9
T_2 : RDP	5.9	4.2	3.5	4.4	4.5	4.9	3.2	3.0	4.1	3.8	16.8	12.2	12.7	13.6	13.8
T_3 : 75% RDP + seed treatment of nano DAP 5 ml/kg seed	5.4	4.1	3.3	3.9	4.2	4.4	3.1	2.7	3.4	3.4	15.7	12.1	12.1	12.6	13.1
T_4 : 50% RDP + seed treatment of nano DAP 5 ml/kg seed	4.7	4.0	3.2	3.5	3.9	3.7	2.9	2.9	3.3	3.2	15.8	12.0	11.1	12.4	12.8
T_5 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 WAS	5.3	4.1	3.5	4.4	4.3	4.3	3.1	3.1	4.1	3.6	16.1	12.1	12.2	13.5	13.5
T_6 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 WAS	5.6	4.1	3.6	4.2	4.4	4.6	3.1	3.2	4.0	3.7	16.6	12.1	12.6	12.9	13.5
T_7 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 WAS	5.3	4.2	3.6	4.4	4.4	4.3	3.1	3.1	4.2	3.7	15.6	12.2	12.8	13.6	13.5
T_8 : T_4 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 WAS	5.1	4.0	3.3	4.0	4.1	4.1	3.0	2.9	3.7	3.4	16.0	12.0	11.8	12.6	13.1
T_9 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 WAS	5.8	4.0	3.7	4.4	4.5	4.9	2.9	3.1	4.2	3.8	16.8	12.0	13.8	13.6	14.1
T_{10}: T_4 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 WAS	5.1	4.0	3.5	4.2	4.2	4.1	3.0	2.9	3.89	3.5	16.2	12.0	12.4	12.7	13.3
CD at 5 %	1.1	0.4	NS	0.3		0.9	0.3	0.3	0.3		1.8	0.3	NS	0.4	
CV (%)	12.2	6.5	7.7	4.9		12.3	6.8	5.5	4.5		6.6	1.3	9.1	1.6	

Table II.34: PMAT 3B: Effect of foliar application of nano DAP on economics of pearl millet in Zone B during *kharif* 2024

Treatments	Gross returns (Rs/ha)					Net returns (Rs/ha)					BC ratio				
	ABD1	DHL	VYP	CBE	Mean	ABD1	DHL	VYP	CBE	Mean	ABD1	DHL	VYP	CBE	Mean
T_1 : Control	54410	47828	41800	55883	49980	27910	19984	26539	19795	23557	2.05	1.72	2.74	1.55	2.02
T_2 : RDP	91124	81513	52103	76645	75346	59624	51419	35126	38557	46181	2.89	2.71	3.07	2.01	2.67
T_3 : 75% RDP + seed treatment of nano DAP 5 ml/kg seed	79812	69915	46592	67559	65969	49362	40364	30015	29721	37365	2.62	2.37	2.81	1.79	2.40
T_4 : 50% RDP + seed treatment of nano DAP 5 ml/kg seed	75794	60064	44225	64398	61120	46594	31076	28077	27060	33202	2.59	2.07	2.74	1.72	2.28
T_5 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 WAS	81663	71766	47446	77788	69666	51013	40015	28897	40450	40094	2.66	2.26	2.56	2.08	2.39
T_6 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 WAS	86872	75260	49089	71791	70753	56122	41959	29040	34203	40331	2.82	2.26	2.45	1.91	2.36
T_7 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 WAS	82981	77148	52206	79906	73060	52131	43147	31657	40068	41751	2.69	2.27	2.54	2.01	2.38
T_8 : T_4 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 WAS	79184	65648	50155	69479	66117	49784	34410	30035	29891	36030	2.69	2.10	2.49	1.76	2.26
T_9 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 WAS	90329	62608	57999	80057	72748	59479	28657	34450	41469	41014	2.93	1.84	2.47	2.07	2.33
T_{10}: T_4 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 WAS	81920	67732	51967	71381	68250	52420	34244	28847	33543	37263	2.78	2.02	2.25	1.89	2.24
CD at 5 %	16614	12950	NS	-		16614	12950	NS	-		NS	0.4	NS	-	
CV (%)	12.0	11.0	12.2	-		19.1	20.5	19.9	-		12.1	11.4	13.3	-	

Table II.35: PMAT 3B: Effect of foliar application of nano DAP on soil chemical properties after harveast of pearl millet in Zone B during kharif 2024

Treatments	Soil status after harvest											
	OC (%)	pH	EC	Available N (kg/ha)			Available P (kg/ha)			Available K (kg/ha)		
		DHL		DHL	VYP	Mean	DHL	VYP	Mean	DHL	VYP	Mean
T_1 : Control	0.47	8.19	0.40	198.0	186.1	192.1	13.6	18.3	16.0	478	389	433
T_2 : RDP	0.47	8.22	0.44	202.0	197.7	199.9	15.9	21.9	18.9	472	414	443
T_3 : 75% RDP + seed treatment of nano DAP 5 ml/kg seed	0.47	8.21	0.43	198.0	193.9	196.0	15.9	20.6	18.2	474	402	438
T_4 : 50% RDP + seed treatment of nano DAP 5 ml/kg seed	0.47	8.21	0.42	198.0	188.1	193.0	15.9	19.6	17.7	474	398	436
T_5 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 WAS	0.47	8.21	0.43	192.0	192.2	192.1	15.9	20.9	18.4	476	411	443
T_6 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 WAS	0.47	8.21	0.43	192.0	197.2	194.6	15.9	20.9	18.4	475	401	438
T_7 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 WAS	0.46	8.21	0.43	193.0	193.0	193.0	15.9	21.3	18.6	474	409	442
T_8 : T_4 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 WAS	0.47	8.20	0.42	194.0	196.7	195.4	15.9	19.5	17.7	476	411	443
T_9 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 WAS	0.47	8.21	0.43	194.0	194.2	194.1	15.9	20.5	18.2	475	400	438
T_{10}: T_4 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 WAS	0.47	8.20	0.42	195.0	189.9	192.5	15.9	19.5	17.7	476	411	444
CD at 5 %	-	-	-	-	NS		-	NS		-	NS	
CV (%)	-	-	-	-	3.8		-	6.5		-	3.4	
Initial (Dhule)	0.5	8.2	0.4	204.0	-		15.4	-		469	-	

Table II.36: PMAT 3B: Effect of foliar application of nano DAP on protein content, N and P content from grain after harveast of pearl millet in Zone B during kharif

Treatment	Protein content (%)				N Content from grain (%)				P Content from grain (%)			
	DHL	VYP	CBE	Mean	DHL	VYP	CBE	Mean	DHL	VYP	CBE	Mean
T_1 : Control	9.63	11.48	10.32	10.48	1.56	1.84	1.18	1.53	0.46	0.24	0.19	0.30
T_2 : RDP	9.81	13.18	11.18	11.39	1.56	2.11	1.39	1.69	0.48	0.37	0.25	0.37
T_3 : 75% RDP + seed treatment of nano DAP 5 ml/kg seed	9.81	12.70	10.56	11.02	1.56	2.03	1.22	1.60	0.47	0.29	0.23	0.33
T_4 : 50% RDP + seed treatment of nano DAP 5 ml/kg seed	9.88	11.28	10.48	10.55	1.56	1.81	1.18	1.52	0.47	0.27	0.22	0.32
T_5 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 WAS	9.88	11.84	11.28	11.00	1.57	1.90	1.41	1.63	0.49	0.28	0.26	0.34
T_6 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 WAS	9.94	12.47	10.86	11.09	1.58	2.00	1.33	1.64	0.50	0.34	0.24	0.36
T_7 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 WAS	9.75	12.80	11.32	11.29	1.57	2.05	1.43	1.68	0.50	0.29	0.26	0.35
T_8 : T_4 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 WAS	9.75	11.05	10.68	10.49	1.57	1.77	1.28	1.54	0.49	0.32	0.23	0.35
T_9 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 WAS	9.75	12.34	11.35	11.15	1.58	1.98	1.46	1.67	0.50	0.35	0.27	0.37
T_{10}: T_4 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 WAS	9.81	12.09	10.73	10.88	1.57	1.94	1.31	1.60	0.49	0.31	0.24	0.35
CD at 5 %	NS	NS	0.42		NS	NS	0.17		NS	0.07	0.02	
CV (%)	1.8	18.9	2.2		3.4	18.9	7.4		10.3	13.6	5.5	

Table II.37: PMAT 3B: Effect of foliar application of nano DAP on plant height, N & P content from fodder after harveast of pearl millet in Zone B during kharif 2024

Treatment	N Content from fodder %)				P Content from fodder (%)				Plant height (cm)				
	DHL	VYP	CBE	Mean	DHL	VYP	CBE	Mean	ABD1	DHL	VYP	CBE	Mean
T_1 : Control	1.00	0.20	0.50	0.57	0.29	0.08	0.13	0.17	170.3	189.5	172.6	151.5	171.0
T_2 : RDP	1.02	0.33	0.58	0.64	0.31	0.13	0.18	0.21	191.7	200.7	181.8	182.3	189.1
T_3 : 75% RDP + seed treatment of nano DAP 5 ml/kg seed	1.01	0.23	0.53	0.59	0.30	0.12	0.14	0.19	193.1	195.5	179.0	168.6	184.0
T_4 : 50% RDP + seed treatment of nano DAP 5 ml/kg seed	1.01	0.22	0.52	0.58	0.30	0.10	0.14	0.18	179.7	194.6	175.4	163.9	178.4
T_5 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 WAS	1.03	0.20	0.58	0.61	0.32	0.12	0.18	0.21	191.6	196.0	182.2	182.5	188.1
T_6 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 WAS	1.03	0.22	0.56	0.61	0.32	0.12	0.17	0.20	191.2	197.0	182.6	176.1	186.7
T_7 : T_3 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 WAS	1.04	0.25	0.59	0.62	0.33	0.12	0.18	0.21	180.6	198.3	184.5	182.8	186.6
T_8 : T_4 + foliar spray of nano DAP 2.5 ml/l at 3 & 5 WAS	1.03	0.26	0.54	0.61	0.32	0.12	0.15	0.20	190.0	195.0	176.7	173.9	183.9
T_9 : T_3 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 WAS	1.05	0.32	0.59	0.65	0.33	0.13	0.18	0.21	194.6	194.7	184.8	183.6	189.4
T_{10}: T_4 + foliar spray of nano DAP 5.0 ml/l at 3 & 5 WAS	1.04	0.28	0.56	0.62	0.33	0.12	0.16	0.21	193.9	195.3	178.7	175.0	185.7
CD at 5 %	NS	NS	0.03		NS	NS	0.02		3.2	NS	NS	5.8	
CV (%)	6.0	30.7	3.1		14.5	15.9	8.7		1.0	2.0	3.6	1.9	

Table II.38: PMAT 4A: Effect of millets & mungbean based intercropping systems on grain yield, dry fodder yield and pearl millet grain equivalent yield under rainfed conditions during kharif 2024 in Zone A

Treatment	Grain yield (q/ha)			Fodder yield (q/ha)			PMGEY (q/ha)		
	HSR	JMR	Mean	HSR	JMR	Mean	HSR	JMR	Mean
T1: Sole pearl millet (45 cm x 10 cm)	41.88	24.49	**33.19**	118.57	37.27	**77.92**	50.92	24.49	**37.70**
T2: Sole Proso millet (30 cm x 5 cm)	5.42	11.30	**8.36**	26.28	13.89	**20.09**	9.23	22.58	**15.90**
T3: Sole Foxtail millet (30 cm x 5 cm)	3.93	10.28	**7.10**	20.46	12.10	**16.28**	1.56	20.56	**11.06**
T4: Sole Little millet (30 cm x 5 cm)	-	20.18	**20.18**	66.02	63.52	**64.77**	11.01	32.28	**21.65**
T5: Sole Barnyard millet (30 cm x 5 cm)	9.65	23.38	**16.51**	55.33	55.52	**55.43**	18.93	37.40	**28.16**
T6: Sole mungbean (30 cm x 5 cm)	3.90	12.67	**8.29**	10.77	13.21	**11.99**	13.83	38.01	**25.92**
T7: Pearl millet + Proso millet (2:2) 2 rows of PM paired at 30 cm: 2 rows of intercrop at 30 cm	37.57	13.95	**25.76**	111.21	21.40	**66.30**	46.59	27.37	**36.98**
T8: Pearl millet + Foxtail millet (2:2) 2 rows of PM paired at 30 cm: 2 rows of intercrop at 30 cm	38.11	14.77	**26.44**	113.19	21.58	**67.39**	47.86	27.51	**37.69**
T9: Pearl millet + Little millet (2:2) 2 rows of PM paired at 30 cm: 2 rows of intercrop at 30 cm	37.84	12.61	**25.22**	116.41	19.69	**68.05**	47.67	30.53	**39.10**
T10: Pearl millet + Barnyard millet (2:2) 2 rows of PM paired at 30 cm: 2 rows of intercrop at 30 cm	32.92	12.54	**22.73**	99.68	18.42	**59.05**	47.72	34.72	**41.22**
T11: Pearl millet + mungbean (2:2) 2 rows of PM paired at 30 cm: 2 rows of intercrop at 30 cm	39.07	19.99	**29.53**	116.53	29.64	**73.08**	50.69	41.43	**46.06**
CD at 5 %							3.41	7.21	
CV (%)							6.3	10.4	

Table II.39: PMAT 4A: Effect of millets & mungbean based intercropping systems on gross returns, net returns and BC ratio of pearl millet under rainfed conditions during kharif 2024 in Zone A

Treatment	Gross returns (Rs/ha)			Net returns (Rs/ha)			BC ratio		
	HSR	JMR	Mean	HSR	JMR	Mean	HSR	JMR	Mean
T1: Sole pearl millet (45 cm x 10 cm)	133657	61225	**97441**	86159	33438	**59799**	2.81	2.20	**2.51**
T2: Sole Proso millet (30 cm x 5 cm)	24221	56450	**40335**	-22827	30476	**3824**	0.51	2.17	**1.34**
T3: Sole Foxtail millet (30 cm x 5 cm)	4095	51400	**27748**	-43003	25426	**-8789**	0.09	1.98	**1.03**
T4: Sole Little millet (30 cm x 5 cm)	28909	80700	**54805**	-18139	54726	**18294**	0.61	3.11	**1.86**
T5: Sole Barnyard millet (30 cm x 5 cm)	49683	93500	**71592**	2585	67526	**35056**	1.05	3.60	**2.33**
T6: Sole mungbean (30 cm x 5 cm)	36312	95025	**65668**	-12525	65574	**26524**	0.74	3.23	**1.99**
T7: Pearl millet + Proso millet (2:2) 2 rows of PM paired at 30 cm: 2 rows of intercrop at 30 cm	122307	68425	**95366**	73312	35116	**54214**	2.50	2.05	**2.27**
T8: Pearl millet + Foxtail millet (2:2) 2 rows of PM paired at 30 cm: 2 rows of intercrop at 30 cm	125640	68775	**97208**	76595	35466	**56031**	2.56	2.06	**2.31**
T9: Pearl millet + Little millet (2:2) 2 rows of PM paired at 30 cm: 2 rows of intercrop at 30 cm	125142	76325	**100733**	76217	43016	**59616**	2.56	2.29	**2.42**
T10: Pearl millet + Barnyard millet (2:2) 2 rows of PM paired at 30 cm: 2 rows of intercrop at 30 cm	125265	86800	**106033**	76220	53491	**64856**	2.55	2.61	**2.58**
T11: Pearl millet + mungbean (2:2) 2 rows of PM paired at 30 cm: 2 rows of intercrop at 30 cm	133061	103575	**118318**	84963	68527	**76745**	2.77	2.96	**2.86**

Table II.40: PMAT 4B: Effect of millets & mungbean based intercropping systems on grain yield, dry fodder yield and pearl millet grain equivalent yield under rainfed conditions during kharif 2024 in Zone B

Treatments	Grain yield (q/ha)				Fodder yield (q/ha)				PMGEY (q/ha)			
	ABD1	CBE	VYP	Mean	ABD1	CBE	VYP	Mean	ABD1	CBE	VYP	Mean
T1: Sole pearl millet (45 cm x 10 cm)	26.83	33.96	17.10	**25.96**	58.35	46.25	53.63	**52.74**	30.79	33.96	17.10	**27.28**
T2: Sole Proso millet (30 cm x 5 cm)	10.45	19.66	14.62	**14.91**	24.24	37.98	35.71	**32.64**	18.94	47.17	21.77	**29.29**
T3: Sole Foxtail millet (30 cm x 5 cm)	9.69	12.28	12.69	**11.55**	22.48	36.56	38.57	**32.54**	17.57	17.68	21.60	**18.95**
T4: Sole Little millet (30 cm x 5 cm)	11.55	14.46	11.41	**12.47**	27.02	50.77	37.35	**38.38**	20.95	39.32	16.99	**25.75**
T5: Sole Barnyard millet (30 cm x 5 cm)	8.69	22.88	13.73	**15.10**	19.56	62.25	41.65	**41.15**	15.73	54.90	23.38	**31.34**
T6: Sole mungbean (30 cm x 5 cm)	9.04	8.01	10.41	**9.15**	16.28	16.69	59.38	**30.78**	22.01	43.79	17.72	**27.84**
T7: Pearl millet + Proso millet (2:2) 2 rows of PM paired at 30 cm: 2 rows of intercrop at 30 cm	14.76	23.87	15.65	**18.09**	28.21	34.78	36.93	**33.31**	27.06	40.10	25.14	**30.77**
T8: Pearl millet + Foxtail millet (2:2) 2 rows of PM at 30 cm: 2 rows of intercrop at 30 cm	15.03	21.31	17.25	**17.86**	34.88	31.57	37.79	**34.75**	27.20	27.13	28.26	**27.53**
T9: Pearl millet + Little millet (2:2) 2 rows of PM paired at 30 cm: 2 rows of intercrop at 30 cm	13.95	25.79	15.84	**18.53**	26.92	36.14	36.67	**33.24**	26.63	39.94	23.99	**30.18**
T10: Pearl millet + Barnyard millet (2:2) 2 rows of PM at 30 cm: 2 rows of intercrop at 30 cm	14.22	20.18	16.82	**17.07**	33.59	30.44	36.03	**33.35**	24.98	39.62	26.81	**30.47**
T11: Pearl millet + mungbean (2:2) 2 rows of PM paired at 30 cr	16.10	26.15	15.40	**19.22**	28.42	32.98	34.76	**32.05**	31.09	37.83	26.30	**31.74**
CD at 5 %									6.81	16.28	2.99	
CV (%)									16.6	18.8	7.7	

Table II.41: PMAT 4B: Effect of millets & mungbean based intercropping systems on gross returns, net returns and BC ratio of pearl millet under rainfed conditions during kharif 2024 in Zone B

Treatments	Gross returns (Rs/ha)				Net returns (Rs/ha)				BC ratio			
	ABD1	VYP	CBE	Mean	ABD1	VYP	CBE	Mean	ABD1	VYP	CBE	Mean
T1: Sole pearl millet (45 cm x 10 cm)	59830	40193	84957	**61660**	3079	23616	45871	**24189**	2.93	2.43	2.17	**2.51**
T2: Sole Proso millet (30 cm x 5 cm)	27887	51156	117968	**65670**	1894	35558	81736	**39729**	2.00	3.28	3.26	**2.85**
T3: Sole Foxtail millet (30 cm x 5 cm)	23821	50759	44245	**39608**	1757	35161	8013	**14977**	1.85	3.25	1.22	**2.11**
T4: Sole Little millet (30 cm x 5 cm)	33794	39941	98345	**57360**	2095	24343	62113	**29517**	2.20	2.56	2.71	**2.49**
T5: Sole Barnyard millet (30 cm x 5 cm)	18398	54940	137312	**70217**	1573	39342	101330	**47415**	1.66	3.52	3.82	**3.00**
T6: Sole mungbean (30 cm x 5 cm)	36935	41636	72087	**50219**	2201	25312	30977	**19497**	2.32	2.55	1.75	**2.21**
T7: Pearl millet + Proso millet (2:2) 2 rows of PM paired at 30 cm: 2 rows of intercrop at 30 cm	47823	59086	100317	**69075**	2706	41488	60855	**35016**	2.50	3.36	2.54	**2.80**
T8: Pearl millet + Foxtail millet (2:2) 2 rows of PM at 30 cm: 2 rows of intercrop at 30 cm	48236	66396	67879	**60837**	2720	48798	28417	**26645**	2.51	3.77	1.72	**2.67**
T9: Pearl millet + Little millet (2:2) 2 rows of PM paired at 30 cm: 2 rows of intercrop at 30 cm	46560	56368	99909	**67612**	2663	38770	60447	**33960**	2.46	3.20	2.53	**2.73**
T10: Pearl millet + Barnyard millet (2:2) 2 rows of PM at 30 cm: 2 rows of intercrop at 30 cm	41697	63009	99117	**67941**	2498	45411	59755	**35888**	2.30	3.58	2.52	**2.80**
T11: Pearl millet + mungbean (2:2) 2 rows of PM paired at 30 cr	59707	61812	94634	**72051**	3109	43488	53940	**33512**	2.87	3.37	2.33	**2.86**
CD at 5 %	20090	7029	-		681	7029	-		0.69	0.42	-	
CV (%)	29.0	7.7	-		16.6	11.2	-		17.4	7.7	-	

Table II.42: PMAT 7A1: Effect of organic and natural farming on grain yield of pearl millet crop during kharif 2022, 2023 and 2024 in Zone A1

Treatment	Grain yield (q/ha)								Zonal Mean
	BKR				MDR				
	2022	2023	2024	Mean	2022	2023	2024	Mean	
T_1:Control	19.34	19.10	16.53	18.32	7.53	6.37	10.67	8.19	**13.26**
T_2: RDN* through Farm yard manure (FYM)	15.55	15.57	18.03	16.38	15.63	14.67	13.90	14.73	**15.56**
T_3: RDN through Vermicompost (VC)	16.39	17.50	18.67	17.52	14.73	13.83	14.50	14.36	**15.94**
T_4: RDN through Sheep or Goat manure	15.96	17.73	18.20	17.30	15.80	15.63	14.87	15.43	**16.37**
T_5: RDN through FYM+ Biofertilizer	14.28	17.17	21.30	17.58	18.53	18.03	15.73	17.43	**17.51**
T_6: RDN through Vermicompost+ Biofertilizer	16.47	18.27	23.77	19.50	17.43	16.93	16.03	16.80	**18.15**
T_7: RDN through Poultry manure + Biofertilizer	16.01	18.33	24.00	19.45	17.83	17.70	16.63	17.39	**18.42**
T_8: *** Cow based bio formulation	16.44	17.13	23.13	18.90	16.73	18.53	13.00	16.09	**17.50**
T_9: RDF**	20.51	19.97	26.00	22.16	19.83	18.73	19.37	19.31	**20.74**
CD at 5 %	3.02	NS	3.13		2.90	2.91	3.33		
CV (%)	9.6	10.6	8.5		10.4	10.7	12.8		

Table II.43: PMAT 7A1: Effect of organic and natural farming on stover of pearl millet crop during kharif 2022, 2023 and 2024 in Zone A1

Treatment	Stover yield (q/ha)								Zonal Mean
	BKR				MDR				
	2022	2023	2024	Mean	2022	2023	2024	Mean	
T_1:Control	38.46	37.20	37.30	37.65	14.13	10.57	18.00	14.23	**25.94**
T_2: RDN* through Farm yard manure (FYM)	32.43	28.87	43.53	34.94	31.17	23.90	24.70	26.59	**30.77**
T_3: RDN through Vermicompost (VC)	30.55	33.27	45.77	36.53	29.40	22.57	26.27	26.08	**31.30**
T_4: RDN through Sheep or Goat manure	31.48	33.90	44.43	36.60	32.73	26.73	27.87	29.11	**32.86**
T_5: RDN through FYM+ Biofertilizer	27.16	30.53	44.10	33.93	38.70	31.47	29.13	33.10	**33.52**
T_6: RDN through Vermicompost+ Biofertilizer	32.10	34.13	51.63	39.29	34.20	30.10	31.23	31.84	**35.57**
T_7: RDN through Poultry manure + Biofertilizer	29.21	34.10	57.70	40.34	35.93	28.83	31.53	32.10	**36.22**
T_8: *** Cow based bio formulation	30.79	33.77	49.63	38.06	33.03	33.53	23.50	30.02	**34.04**
T_9: RDF**	40.52	39.80	59.00	46.44	41.37	33.90	35.17	36.81	**41.63**
CD at 5 %	7.29	5.63	13.09		5.47	5.98	5.63		
CV (%)	6.9	9.5	15.6		9.7	12.8	11.7		

Table II.44: PMAT 7A1: Effect of organic and natural farming on growth and yield attributes of pearl millet crop during kharif 2024 in Zone A1

Treatment	Plant height (cm)			Plant population ('000/ha)			Total tillers/plant			Effective tillers/plant			Test wt. (g)		
	BKR	MDR	Mean	BKR	MDR	Mean	BKR	MDR	Mean	BKR	MDR	Mean	BKR	MDR	Mean
T_1:Control	138.3	131.4	134.9	-	106.7	106.7	3.7	2.5	3.1	3.0	1.9	2.5	7.4	8.7	8.0
T_2: RDN* through Farm yard manure (FYM)	146.2	141.9	144.1	-	108.0	108.0	4.0	3.1	3.6	3.3	2.1	2.7	7.9	8.6	8.2
T_3: RDN through Vermicompost (VC)	147.7	144.2	146.0	-	108.5	108.5	4.3	3.2	3.8	3.6	2.3	3.0	7.9	8.7	8.3
T_4: RDN through Sheep or Goat manure	147.2	145.4	146.3	-	107.8	107.8	4.0	3.3	3.6	3.3	2.5	2.9	8.1	8.7	8.4
T_5: RDN through FYM+ Biofertilizer	150.0	148.0	149.0	-	109.9	109.9	4.2	3.4	3.8	3.5	2.6	3.0	7.8	8.8	8.3
T_6: RDN through Vermicompost+ Biofertilizer	151.8	156.2	154.0	-	109.3	109.3	4.4	3.5	4.0	3.7	2.8	3.2	8.1	8.9	8.5
T_7: RDN through Poultry manure + Biofertilizer	153.4	152.1	152.8	-	111.1	111.1	4.4	3.7	4.1	3.6	2.9	3.3	8.1	8.7	8.4
T_8: *** Cow based bio formulation	151.7	135.3	143.5	-	109.1	109.1	4.4	2.7	3.6	3.6	2.2	2.9	7.7	8.7	8.2
T_9: RDF**	158.3	159.9	159.1	-	112.1	112.1	4.6	4.1	4.4	3.7	3.5	3.6	8.2	8.8	8.5
CD at 5 %	NS	16.1		-	NS		NS	0.4		NS	0.4		NS	NS	
CV (%)	5.8	6.3		-	3.4		22.1	7.7		22.9	8.2		4.4	2.2	

Table II.45: PMAT 7A1: Effect of organic and natural farming on economics of pearl millet crop during kharif 2023 and 2024 in Zone A1

Treatment	Gross returns (Rs./ha)				Zonal mean	Net returns (Rs./ha)				Zonal mean	BC ratio (%)				Zonal mean
	BKR	MDR				BKR	MDR				BKR	MDR			
	2023	2023	2024	Mean		2023	2023	2024	Mean		2023	2023	2024	Mean	
T_1:Control	63468	22257	39683	30970	47219	33468	5292	20618	12955	23211	2.1	1.3	2.1	1.7	1.9
T_2: RDN* through Farm yard manure (FYM)	50998	51007	52543	51775	51387	14998	17865	24743	21304	18151	1.4	1.5	1.9	1.7	1.6
T_3: RDN through Vermicompost (VC)	57750	48123	55136	51630	54690	27250	14315	26336	20326	23788	1.9	1.4	1.9	1.7	1.8
T_4: RDN through Sheep or Goat manure	58615	55123	57139	56131	57373	28115	29648	30664	30156	29136	1.9	2.2	2.2	2.2	2.0
T_5: RDN through FYM+ Biofertilizer	55592	63963	60237	62100	58846	31592	30920	31737	31329	31460	2.3	1.9	2.1	2.0	2.2
T_6: RDN through Vermicompost+ Biofertilizer	59929	60393	62389	61391	60660	29429	26684	28680	27682	28556	1.9	1.8	1.9	1.8	1.9
T_7: RDN through Poultry manure + Biofertilizer	60117	61550	64160	62855	61486	29617	36174	36460	36317	32967	2.0	2.4	2.3	2.4	2.2
T_8: *** Cow based bio formulation	57138	66453	49400	57927	57533	28138	42733	27400	35067	31603	2.0	2.8	2.2	2.5	2.2
T_9: RDF**	66797	67173	73696	70435	68616	37797	46801	48196	47499	42648	2.3	3.3	2.9	3.1	2.7
CD at 5 %	8095	9857	12248			8095	9857	12248			0.3	0.4	0.5		
CV (%)	7.9	10.2	12.3			16.0	20.3	23.0			8.0	11.3	12.2		

Table II.46: PMAT 7A1: Effect of organic and natural farming on the enzymatic activities in pearl millet under rainfed conditions during kharif 2024 in Mandor center Zone A1

Treatments	Dehydrogenase (µg TPF) (g soil)-1 (day)-1	Alkaline phosphatase (µg) (g soil)-1 (h)-1	Acid phosphatase (µg) (g soil)-1 (h)-1	Urease (µmol NH3) (g soil)-1 (h)-1
T_1:Control	172.0	5.67	2.62	8.22
T_2: RDN* through Farm yard manure (FYM)	271.7	5.87	3.13	10.77
T_3: RDN through Vermicompost (VC)	286.8	5.99	3.25	10.72
T_4: RDN through Sheep or Goat manure	301.1	6.86	3.77	10.20
T_5: RDN through FYM+ Biofertilizer	458.1	10.83	4.19	14.70
T_6: RDN through Vermicompost+ Biofertilizer	444.9	10.53	4.16	13.47
T_7: RDN through Poultry manure + Biofertilizer	377.0	9.61	4.34	14.06
T_8: *** Cow based bio formulation	243.8	6.11	3.57	9.58
T_9: RDF**	252.6	6.22	2.54	8.25
CD at 5 %	37.9	0.62	0.84	1.55
CV (%)	7.0	4.7	13.7	8.0

Table II.47: PMAT 7A1: Effect of organic and natural farming on the soil microbial counts in pearl millet under rainfed conditions during kharif 2024 in Mandor center Zone A1

Treatments	SMBC (µg) (g soil)-1	Bacterial population log10((CFU) (g soil)-1)	Fungal population log10((CFU) (g soil)-1)	Actinomycetes population log10((CFU) (g soil)-1)
T_1:Control	300.17	9.43	5.52	7.39
T_2: RDN* through Farm yard manure (FYM)	358.67	9.81	5.85	7.92
T_3: RDN through Vermicompost (VC)	367.53	9.71	5.94	7.78
T_4: RDN through Sheep or Goat manure	432.83	10.33	6.24	7.97
T_5: RDN through FYM+ Biofertilizer	475.70	11.26	6.58	9.17
T_6: RDN through Vermicompost+ Biofertilizer	455.30	11.10	6.96	9.31
T_7: RDN through Poultry manure + Biofertilizer	440.30	10.96	6.90	8.84
T_8: *** Cow based bio formulation	364.43	9.74	6.16	8.29
T_9: RDF**	324.77	9.57	5.54	7.80
CD at 5 %	74.48	0.51	0.43	0.42
CV (%)	10.91	2.86	3.96	2.88

Table II.48: PMAT 7A1: Effect of organic and natural farming on productivity, growth and yield attributes of chickpea crop during Rabi 2022-23 and 2023-24 in Mandor centre of Zone A1

Treatments	Seed yield (q/ha)			Straw yield (q/ha)			Plant height (cm)	Number of primary branches/plant	Number of pods/plant	Test wt. (g)
	2022-23	2023-24	Mean	2022-23	2023-24	Mean				
T_1:Control	10.97	14.93	**12.95**	17.90	21.97	**19.93**	38.6	2.9	26.6	138.5
T_2: RDN* through Farm yard manure (FYM)	18.90	19.30	**19.10**	24.40	27.90	**26.15**	46.0	3.4	31.9	141.8
T_3: RDN through Vermicompost (VC)	18.13	19.67	**18.90**	27.13	28.33	**27.73**	49.6	3.6	33.1	143.1
T_4: RDN through Sheep or Goat manure	21.20	20.63	**20.92**	29.90	28.80	**29.35**	50.2	3.7	35.3	143.3
T_5: RDN through FYM+ Biofertilizer	22.93	21.07	**22.00**	32.20	29.30	**30.75**	51.9	3.9	37.4	144.2
T_6: RDN through Vermicompost+ Biofertilizer	22.13	21.93	**22.03**	30.43	30.60	**30.52**	53.7	4.1	39.0	145.1
T_7: RDN through Poultry manure + Biofertilizer	22.43	23.00	**22.72**	31.60	31.47	**31.53**	55.3	4.3	43.3	146.5
T_8: *** Cow based bio formulation	24.27	19.13	**21.70**	33.17	27.73	**30.45**	43.3	3.2	30.4	140.0
T_9: RDF**	26.43	25.80	**26.12**	35.83	33.93	**34.88**	58.8	4.7	48.8	150.3
CD at 5 %	3.08	2.85		4.88	2.47		5.8	0.4	6.3	4.6
CV (%)	8.5	7.9		9.6	4.9		6.6	6.5	9.9	1.9

Table II.49: PMAT 7A1: Effect of organic and natural farming on economics of chickpea crop during Rabi 2022-23 and 2023-24 in Mandor centre of Zone A1

Treatments	Gross returns (Rs./ha)			Net returns (Rs./ha)			BC ratio (%)		
	2023	2024	Mean	2023	2024	Mean	2023	2024	Mean
T_1:Control	72827	101007	**86917**	48862	72007	**60435**	3.07	3.48	**3.28**
T_2: RDN* through Farm yard manure (FYM)	120436	130102	**125269**	85274	96302	**90788**	3.40	3.85	**3.63**
T_3: RDN through Vermicompost (VC)	118379	132487	**125433**	80551	94687	**87619**	3.13	3.50	**3.32**
T_4: RDN through Sheep or Goat manure	137022	138165	**137594**	96527	102690	**99609**	3.37	3.90	**3.63**
T_5: RDN through FYM+ Biofertilizer	148149	140973	**144561**	112702	103473	**108087**	4.20	3.76	**3.98**
T_6: RDN through Vermicompost+ Biofertilizer	142428	146857	**144643**	104315	104148	**104232**	3.73	3.44	**3.59**
T_7: RDN through Poultry manure + Biofertilizer	144972	153440	**149206**	104192	116740	**110466**	3.53	4.18	**3.86**
T_8: *** Cow based bio formulation	156006	129045	**142526**	125286	95245	**110266**	5.07	3.82	**4.44**
T_9: RDF**	169686	170892	**170289**	142314	136392	**139353**	6.20	4.96	**5.58**
CD at 5 %	19785	17549		19785	17549		0.57	0.51	**0.54**
CV (%)	8.4	7.3		11.3	9.8		8.2	7.5	**7.8**

Table II.50: PMAT 7A1: Effect of organic and natural farming on the enzymatic activities in chickpea under rainfed conditions during Rabi 2023-24 in Mandor center Zone A1

Treatments	Dehydrogenase (µg TPF) (g soil)-1 (day)-1	Alkaline phosphatase (µg) (g soil)-1 (h)-1	Acid phosphatase (µg) (g soil)-1 (h)-1	Urease (µmol NH3) (g soil)-1(h)-1
T_1:Control	163.8	5.43	2.60	8.14
T_2: RDN* through Farm yard manure (FYM)	262.7	5.63	3.10	10.66
T_3: RDN through Vermicompost (VC)	278.2	5.73	3.23	10.62
T_4: RDN through Sheep or Goat manure	281.0	6.57	3.60	9.71
T_5: RDN through FYM+ Biofertilizer	409.9	7.37	3.80	13.36
T_6: RDN through Vermicompost+ Biofertilizer	392.7	7.20	3.77	12.25
T_7: RDN through Poultry manure + Biofertilizer	335.5	6.60	3.97	12.78
T_8: *** Cow based bio formulation	235.2	5.87	3.53	9.49
T_9: RDF**	225.7	6.00	2.50	8.17
CD at 5 %	34.0	0.56	0.81	1.48
CV (%)	6.8	5.1	13.9	8.0

Table II.51: PMAT 7A1: Effect of organic and natural farming on the soil microbial counts in chickpea under rainfed conditions during Rabi 2023-24 in Mandor center Zone A1

Treatments	SMBC (µg) (g soil)-1	Bacterial population log10((CFU) (g soil)-1)	Fungal population log10((CFU) (g soil)-1)	Actinomycetes population log10((CFU) (g soil)-1)
T_1:Control	297.2	9.33	5.46	7.32
T_2: RDN* through Farm yard manure (FYM)	355.1	9.71	5.79	7.85
T_3: RDN through Vermicompost (VC)	363.9	9.61	5.88	7.71
T_4: RDN through Sheep or Goat manure	412.2	9.84	5.95	7.59
T_5: RDN through FYM+ Biofertilizer	432.4	10.24	5.98	8.34
T_6: RDN through Vermicompost+ Biofertilizer	413.9	10.10	6.32	8.46
T_7: RDN through Poultry manure + Biofertilizer	400.3	9.96	6.28	8.03
T_8: *** Cow based bio formulation	360.8	9.64	6.09	8.20
T_9: RDF**	321.6	9.48	5.48	7.73
CD at 5 %	71.5	0.49	0.41	0.39
CV (%)	11.0	2.9	4.0	2.8

Table II.52: PMAT 7A: Effect of organic and natural farming on grain yield of pearl millet crop during kharif 2022, 2023 and 2024 in Zone A

Treatments	Grain yield (q/ha)															Zonal mean
	HSR				JMR				JPR				JMU			
	2022	2023	2024	Mean	2022	2023	2024	Mean	2022	2023	2024	Mean	2022	2024	Mean	
T_1:Control	21.36	24.59	22.14	22.70	9.99	13.81	10.85	11.55	30.34	16.24	19.88	22.15	18.19	19.79	18.99	18.85
T_2: RDN* through Farm yard manure (FYM)	27.71	30.26	31.40	29.79	12.71	17.35	12.28	14.11	33.31	18.78	20.39	24.16	19.73	20.09	19.91	22.00
T_3: RDN through Vermicompost (VC)	28.91	31.35	31.52	30.59	11.42	16.69	11.81	13.31	37.72	23.17	22.02	27.64	20.29	21.19	20.74	23.07
T_4: RDN through Poultry manure(PM)	29.88	32.23	33.18	31.76	15.50	19.44	18.16	17.70	38.54	22.76	24.57	28.62	21.39	23.06	22.23	25.08
T_5: RDN through FYM+ Biofertilizer	31.32	32.51	33.11	32.31	14.64	20.67	20.18	18.50	37.49	21.20	22.67	27.12	23.21	23.56	23.39	25.33
T_6: RDN through Vermicompost+ Biofertilizer	32.09	33.52	33.58	33.07	12.65	18.23	14.48	15.12	40.14	26.42	24.61	30.39	24.03	24.10	24.07	25.66
T_7: RDN through Poultry manure + Biofertilizer	33.28	34.23	34.57	34.03	19.37	24.25	22.63	22.08	39.72	24.66	26.60	30.33	24.90	25.66	25.28	27.93
T_8: *** Cow based bio formulation	26.26	27.13	26.62	26.67	13.32	21.80	20.38	18.50	38.06	23.46	25.55	29.02	20.83	21.91	21.37	23.89
T_9: RDF**	40.56	40.69	39.15	40.13	25.46	28.05	24.39	25.97	39.34	23.71	26.14	29.73	28.96	29.97	29.46	31.32
CD at 5 %	3.04	3.20	4.35		3.59	6.11	4.26		4.34	3.83	3.23		4.46	4.41		
CV (%)	5.8	5.8	7.9		13.7	17.5	14.2		6.7	9.8	7.8		11.4	10.9		

Table II.53: PMAT 7A: Effect of organic and natural farming on stover yeld of pearl millet crop during kharif 2022, 2023 and 2024 in Zone A

Treatments	Stover yield (q/ha)															Zonal mean
	HSR				JMR				JPR				JMU			
	2022	2023	2024	Mean	2022	2023	2024	Mean	2022	2023	2024	Mean	2022	2024	Mean	
T_1:Control	64.90	79.92	62.43	69.08	23.43	28.95	19.95	24.11	79.75	39.67	45.19	54.87	37.12	38.76	37.94	41.76
T_2: RDN* through Farm yard manure (FYM)	75.97	101.36	88.49	88.60	28.33	35.24	22.67	28.75	87.31	47.23	50.12	61.55	39.25	41.68	40.47	49.70
T_3: RDN through Vermicompost (VC)	77.61	104.43	92.13	91.39	26.85	34.15	21.26	27.42	98.88	56.37	52.63	69.29	41.38	42.98	42.18	52.21
T_4: RDN through Poultry manure(PM)	84.14	106.15	93.17	94.49	31.08	36.44	29.61	32.38	96.42	57.89	51.80	68.70	42.09	43.87	42.98	54.45
T_5: RDN through FYM+ Biofertilizer	85.87	107.05	97.05	96.66	31.33	40.30	31.93	34.52	98.33	57.95	51.03	69.10	43.35	44.47	43.91	55.92
T_6: RDN through Vermicompost+ Biofertilizer	87.10	108.49	99.10	98.23	30.12	35.42	26.41	30.65	98.23	64.26	53.75	72.08	46.44	46.09	46.26	56.26
T_7: RDN through Poultry manure + Biofertilizer	90.15	109.13	101.17	100.15	36.76	43.78	35.18	38.58	97.33	63.14	54.80	71.76	45.40	48.11	46.76	58.94
T_8: *** Cow based bio formulation	75.56	87.94	74.83	79.44	30.81	41.46	32.19	34.82	99.82	57.97	55.87	71.22	41.91	43.77	42.84	51.71
T_9: RDF**	111.79	116.81	107.95	112.19	42.12	49.92	38.24	43.43	97.11	57.79	56.14	70.35	50.64	51.77	51.21	63.86
CD at 5 %	8.71	6.02	5.82		5.87	8.27	4.80		10.69	8.21	5.69		NS	5.69		
CV (%)	6.0	3.4	3.7		10.8	12.3	9.6		6.5	8.4	6.2		10.1	7.3		

Table II.54: PMAT 7A: Effect of organic and natural farming on growth and yield attributes of pearl millet crop during kharif 2024 in Zone A

Treatment	Total tillers/plant					Effective tillers/plant					Earhead Length (cm)					Plant height (cm)				
	HSR	JMR	JPR	JMU	Mean	HSR	JMR	JPR	JMU	Mean	HSR	JMR	JPR	JMU	Mean	HSR	JMR	JPR	JMU	Mean
T_1:Control	2.0	2.2	3.9	3.2	2.8	1.3	1.4	2.2	2.3	1.8	20.7	19.4	25.0	23.3	22.1	185.0	155.5	158.3	185.6	171.1
T_2: RDN* through Farm yard manure (FYM)	2.7	2.5	4.0	3.3	3.1	2.0	1.6	2.8	2.5	2.2	22.3	20.1	26.5	23.8	23.2	206.7	159.7	171.7	186.1	181.0
T_3: RDN through Vermicompost (VC)	2.8	2.4	5.2	3.5	3.5	2.1	1.5	3.1	2.6	2.3	22.7	19.7	27.0	23.9	23.3	200.0	156.5	185.0	194.5	184.0
T_4: RDN through Poultry manure(PM)	3.0	2.7	5.1	3.7	3.6	2.2	2.0	3.3	2.7	2.6	22.8	20.5	27.0	25.2	23.9	198.3	164.0	189.3	198.4	187.5
T_5: RDN through FYM+ Biofertilizer	2.8	2.9	4.8	3.9	3.6	2.2	2.1	3.1	3.2	2.7	20.8	21.1	27.3	25.6	23.7	193.3	170.1	185.0	198.6	186.8
T_6: RDN through Vermicompost+ Biofertilizer	2.9	2.6	5.3	3.9	3.7	2.3	1.8	3.3	3.2	2.7	22.7	20.2	27.0	25.9	23.9	188.3	163.4	192.3	200.8	186.2
T_7: RDN through Poultry manure + Biofertilizer	3.0	3.5	5.2	4.1	3.9	2.4	2.7	3.7	3.3	3.0	22.0	23.2	28.5	26.2	25.0	202.7	174.3	191.7	201.1	192.4
T_8: *** Cow based bio formulation	2.3	3.1	5.0	3.6	3.5	1.7	2.4	3.2	2.6	2.5	20.7	21.7	28.0	24.6	23.8	178.3	171.4	183.3	193.5	181.6
T_9: RDF**	3.3	3.6	5.3	4.1	4.1	2.6	2.9	3.7	3.3	3.1	24.7	25.1	28.5	26.4	26.2	210.0	178.4	191.7	205.1	196.3
CD at 5 %	0.6	0.5	0.6	NS		0.6	0.4	0.5	NS		2.3	3.0	2.0	NS		17.5	15.0	19.6	NS	
CV (%)	12.0	9.4	6.8	12.2		15.8	12.1	8.4	16.4		6.0	8.1	4.3	7.8		5.1	5.2	6.1	5.7	

Table II.55: PMAT 7A: Effect of organic and natural farming on test weight, protein content and earhead girth of pearl millet crop during kharif 2024 in Zone A

Treatment	Test weight (g)					Protein content (%)				Earhead Girth (cm)					Plant population ('000/ha)		
	HSR	JMR	JPR	JMU	Mean	HSR	JMR	JPR	Mean	HSR	JMR	JPR	JMU	Mean	HSR	JPR	Mean
T_1:Control	9.0	9.1	10.7	11.9	10.2	8.6	9.2	8.9	8.9	36.1	2.5	28.1	30.8	24.4	138.6	167.7	153.2
T_2: RDN* through Farm yard manure (FYM)	10.3	10.1	10.9	11.7	10.8	9.0	9.4	9.0	9.2	38.0	2.8	30.1	33.1	26.0	140.5	166.0	153.3
T_3: RDN through Vermicompost (VC)	10.4	9.7	11.6	12.8	11.1	9.2	10.3	9.1	9.5	37.1	2.7	32.0	33.6	26.4	140.7	168.3	154.5
T_4: RDN through Poultry manure(PM)	10.5	10.3	11.5	12.9	11.3	9.2	8.7	9.2	9.0	37.7	3.0	32.2	34.6	26.8	141.2	170.3	155.8
T_5: RDN through FYM+ Biofertilizer	10.5	10.4	11.0	13.1	11.3	9.2	11.2	9.1	9.8	38.2	3.1	30.6	36.6	27.1	142.7	165.7	154.2
T_6: RDN through Vermicompost+ Biofertilizer	10.6	10.1	11.6	13.3	11.4	9.4	10.1	9.2	9.6	36.1	2.8	32.3	37.5	27.2	142.8	170.0	156.4
T_7: RDN through Poultry manure + Biofertilizer	10.9	10.8	11.6	13.5	11.7	9.5	11.1	9.3	10.0	36.6	3.3	32.8	37.8	27.6	143.2	168.0	155.6
T_8: *** Cow based bio formulation	9.9	10.5	11.1	12.1	10.9	8.8	11.3	9.0	9.7	37.1	3.2	29.1	34.3	25.9	141.7	167.0	154.4
T_9: RDF**	11.0	11.1	11.4	15.3	12.2	10.1	10.0	8.9	9.7	38.0	3.5	31.5	40.7	28.4	142.3	169.0	155.7
CD at 5 %	0.5	1.1	NS	NS		0.3	0.7	NS		NS	0.4	2.4	NS		NS	NS	
CV (%)	3.0	6.3	3.9	8.9		4.2	3.8	3.5		4.0	8.1	4.5	13.5		1.4	2.3	

Table II.56: PMAT 7A: Effect of organic and natural farming on soil chemical properties after pearl millet crop harvest during kharif 2022, 2023 and 2024 in Zone A

Treatment	Soil status after harvest																
	OC (%)								Zonal Mean	pH				EC			
	HSR				JMR					HSR							
	2022	2023	2024	Mean	2022	2023	2024	Mean		2022	2023	2024	Mean	2022	2023	2024	Mean
T_1:Control	0.32	0.33	0.32	0.32	0.51	0.49	0.47	0.49	0.41	8.31	8.20	8.16	8.22	0.27	0.31	0.30	0.30
T_2: RDN* through Farm yard manure (FYM)	0.35	0.38	0.40	0.38	0.62	0.63	0.65	0.64	0.51	8.29	8.17	8.13	8.20	0.26	0.35	0.33	0.31
T_3: RDN through Vermicompost (VC)	0.34	0.37	0.38	0.36	0.58	0.60	0.63	0.60	0.48	8.29	8.12	8.14	8.19	0.25	0.36	0.31	0.31
T_4: RDN through Poultry manure(PM)	0.34	0.35	0.37	0.35	0.65	0.66	0.68	0.66	0.51	8.30	8.15	8.16	8.21	0.26	0.32	0.31	0.30
T_5: RDN through FYM+ Biofertilizer	0.36	0.39	0.42	0.39	0.66	0.69	0.71	0.69	0.54	8.28	8.15	8.08	8.17	0.25	0.34	0.31	0.30
T_6: RDN through Vermicompost+ Biofertilizer	0.35	0.38	0.39	0.37	0.64	0.65	0.68	0.65	0.51	8.28	8.16	8.10	8.18	0.25	0.34	0.30	0.30
T_7: RDN through Poultry manure + Biofertilizer	0.36	0.37	0.38	0.37	0.68	0.71	0.72	0.70	0.54	8.29	8.25	8.12	8.22	0.25	0.34	0.30	0.29
T_8: *** Cow based bio formulation	0.33	0.34	0.34	0.34	0.59	0.60	0.63	0.61	0.47	8.30	8.22	8.13	8.22	0.27	0.35	0.30	0.31
T_9: RDF**	0.30	0.32	0.33	0.32	0.46	0.45	0.44	0.45	0.38	8.32	8.23	8.19	8.25	0.28	0.34	0.32	0.32
CD at 5 %	0.03	0.02	0.02		0.04	0.02	0.07			0.02	NS	0.05		0.02	0.03	NS	
CV (%)	5.3	4.1	3.2		3.9	2.1	6.7			0.2	0.8	0.5		4.7	6.4	5.1	

Table II.57: PMAT 7A: Effect of organic and natural farming on available N, P and K status of soil after pearl millet harvest during kharif 2022, 2023 and 2024 in Zone A

Treatment	Soil status after harvest																
	Available N (kg/ha)								Zonal Mean	Av. P (kg/ha)				Av. K(kg/ha)			
	HSR				JMR					JMR				JMR			
	2022	2023	2024	Mean	2022	2023	2024	Mean		2022	2023	2024	Mean	2022	2023	2024	Mean
T_1:Control	183.3	183.5	179.7	182.2	186.1	183.5	182.5	184.0	182.9	18.2	18.0	17.5	17.9	296.4	293.5	291.6	294
T_2: RDN* through Farm yard manure (FYM)	188.3	191.7	194.8	191.6	191.6	192.6	192.8	192.3	191.6	22.3	22.8	22.9	22.7	299.7	300.8	301.7	301
T_3: RDN through Vermicompost (VC)	188.7	192.0	192.7	191.1	190.5	191.9	192.1	191.5	191.0	22.2	22.4	22.7	22.4	308.8	310.6	311.7	310
T_4: RDN through Poultry manure(PM)	189.0	193.3	193.7	192.0	198.3	200.1	201.2	199.9	193.3	25.0	25.4	25.4	25.3	317.3	319.9	320.8	319
T_5: RDN through FYM+ Biofertilizer	189.0	194.2	195.3	192.8	188.6	189.9	190.5	189.6	192.0	24.4	24.6	24.9	24.6	315.7	317.4	318.4	317
T_6: RDN through Vermicompost+ Biofertilizer	190.0	196.0	193.8	193.3	199.6	201.8	202.0	201.2	194.5	24.9	25.1	25.2	25.0	320.5	321.6	322.2	321
T_7: RDN through Poultry manure + Biofertilizer	191.0	196.7	194.5	194.0	202.9	205.0	205.6	204.5	195.8	27.0	27.6	27.8	27.5	322.0	323.9	324.1	323
T_8: *** Cow based bio formulation	186.7	188.6	183.7	186.3	196.6	199.0	199.1	198.2	188.4	24.4	24.8	24.9	24.7	317.0	318.2	319.0	318
T_9: RDF**	186.7	187.3	192.7	188.9	225.4	223.4	220.2	223.0	196.2	27.2	27.2	28.3	27.5	311.3	309.8	315.7	312
CD at 5 %	3.1	5.0	4.3		10.5	9.6	20.0			1.6	2.2	4.3		10.5	9.3	19.4	
CV (%)	1.0	1.5	1.3		3.0	2.8	5.8			3.9	5.2	10.1		1.9	1.7	3.5	

Table II.58: PMAT 7A: Effect of organic and natural farming on gross and net returns of pearl millet crop during kharif 2022, 2023 and 2024 in Zone A

Treatment	Gross returns (Rs./ha)								Zonal mean	Net returns (Rs./ha)								Zonal mean
	HSR				JMR					HSR				JMR				
	2022	2023	2024	Mean	2022	2023	2024	Mean		2022	2023	2024	Mean	2022	2023	2024	Mean	
T_1:Control	63175	77459	70595	**70410**	24658	47220	34545	**35474**	**52942**	3703	8349	24438	**12163**	6828	29390	15075	**17098**	**14631**
T_2: RDN* through Farm yard manure (FYM)	80320	95929	100115	**92121**	31066	59098	39107	**43090**	**67606**	5361	18721	36815	**20299**	5236	33268	11637	**16714**	**18506**
T_3: RDN through Vermicompost (VC)	83460	99254	101165	**94626**	28202	56898	37556	**40885**	**67756**	-8327	199	17793	**3222**	-5628	23068	6086	**7842**	**5532**
T_4: RDN through Poultry manure(PM)	87053	101798	105731	**98194**	37193	65606	57441	**53413**	**75804**	18389	31728	50688	**33602**	17363	37776	27971	**27703**	**30653**
T_5: RDN through FYM+ Biofertilizer	90770	102685	106316	**99924**	35549	70072	63733	**56451**	**78188**	15703	25327	42910	**27980**	9719	44242	36263	**30075**	**29027**
T_6: RDN through Vermicompost+ Biofertilizer	92832	105506	107975	**102104**	31328	61774	46081	**46394**	**74249**	937	6301	24499	**10579**	-2652	27794	14461	**13201**	**11890**
T_7: RDN through Poultry manure + Biofertilizer	96246	107400	110972	**104873**	46085	81508	71408	**66334**	**85603**	27473	37180	55825	**40159**	26105	53528	41788	**40474**	**40316**
T_8: *** Cow based bio formulation	76816	85406	84852	**82358**	32799	73692	64359	**56950**	**69654**	9206	18623	29036	**18955**	10194	51012	39994	**33733**	**26344**
T_9: RDF**	117668	125088	124367	**122374**	59325	80134	76994	**72151**	**97262**	49854	56178	69883	**58638**	37967	58776	53717	**50153**	**54396**

Table II.59: PMAT 7A: Effect of organic and natural farming on BC ratio of pearl millet crop during kharif 2022, 2023 and 2024 in Zone A

Treatment	BC ratio (%)								Zonal mean
	HSR				JMR				
	2022	2023	2024	Mean	2022	2023	2024	Mean	
T_1:Control	1.06	1.12	1.53	**1.24**	1.38	2.65	1.77	**1.93**	**1.59**
T_2: RDN* through Farm yard manure (FYM)	1.07	1.24	1.58	**1.30**	1.20	2.29	1.42	**1.64**	**1.47**
T_3: RDN through Vermicompost (VC)	0.91	1.00	1.21	**1.04**	0.83	1.68	1.19	**1.23**	**1.14**
T_4: RDN through Poultry manure(PM)	1.27	1.45	1.92	**1.55**	1.88	2.36	1.95	**2.06**	**1.81**
T_5: RDN through FYM+ Biofertilizer	1.21	1.33	1.68	**1.40**	1.38	2.71	2.32	**2.14**	**1.77**
T_6: RDN through Vermicompost+ Biofertilizer	1.01	1.06	1.29	**1.12**	0.92	1.82	1.46	**1.40**	**1.26**
T_7: RDN through Poultry manure + Biofertilizer	1.40	1.53	2.01	**1.65**	2.31	2.91	2.41	**2.54**	**2.10**
T_8: *** Cow based bio formulation	1.14	1.28	1.52	**1.31**	1.45	3.25	2.64	**2.45**	**1.88**
T_9: RDF**	1.74	1.82	2.28	**1.94**	2.78	3.75	3.31	**3.28**	**2.61**

Table II.60: PMAT 7: Effect of organic and natural farming on the soil microbial counts after pearl millet crop harvest at Hisar during kharif 2022, 2023 and 2024 Zone A

Treatment	Bacterial count				Fungal count (10^5 cfu/g soil)				Actinomycetes count ($10^{6/5*}$ cfu/g soil)			
	HSR ($10^{9/7*}$cfu/g soil)				HSR				HSR			
	2022	2023	2024*	Mean	2022	2023	2024*	Mean	2022	2023	2024*	Mean
T_1:Control	3.30	4.54	4.10	3.98	3.35	3.32	2.80	3.16	2.20	2.77	10.83	5.27
T_2: RDN* through Farm yard manure (FYM)	4.50	5.86	5.57	5.31	3.53	3.71	3.48	3.57	2.42	3.10	11.93	5.82
T_3: RDN through Vermicompost (VC)	4.60	5.94	5.37	5.30	3.52	3.41	4.03	3.65	2.40	3.23	13.92	6.52
T_4: RDN through Poultry manure(PM)	4.40	5.73	5.05	5.06	3.51	3.63	4.52	3.89	2.36	3.35	13.83	6.51
T_5: RDN through FYM+ Biofertilizer	5.20	6.46	5.82	5.82	3.64	3.75	6.52	4.64	2.54	3.33	14.51	6.79
T_6: RDN through Vermicompost+ Biofertilizer	5.40	6.66	5.75	5.94	3.58	3.67	7.12	4.79	2.61	3.37	16.52	7.50
T_7: RDN through Poultry manure + Biofertilizer	5.35	6.07	5.52	5.64	3.54	3.69	7.47	4.90	2.54	3.40	15.70	7.21
T_8: *** Cow based bio formulation	5.50	6.13	5.25	5.63	4.51	3.60	4.50	4.20	2.88	3.32	13.98	6.73
T_9: RDF**	3.18	4.91	4.95	4.35	3.12	3.33	3.53	3.32	2.02	2.98	11.85	5.62
0-15 cm before sowing (Initial status)	3.20	4.96	4.34		3.15	3.36	3.46		2.12	3.15	12.06	5.78
CD at 5 %	1.05	0.21	0.38		0.92	NS	0.36		0.56	0.17	0.68	
CV (%)	7.6	2.1	4.2		8.7	5.4	4.3		7.5	3.1	2.9	

Table II.61: PMAT 7A: Effect of organic and natural farming on seed yield of mustard crop in Pearl millet-mustard cropping system during Rabi 2022-23 and 2023-24 in Zone A

Treatment	Seed yield (q/ha)									Zonal mean
	HSR			JMR			JPR			
	2022-23	2023-24	Mean	2022-23	2023-24	Mean	2022-23	2023-24	Mean	
T_1:Control	5.26	5.45	5.36	5.81	4.65	5.23	8.68	8.55	8.62	6.40
T_2: RDN* through Farm yard manure (FYM)	7.50	7.84	7.67	7.99	5.62	6.81	11.17	10.33	10.75	8.41
T_3: RDN through Vermicompost (VC)	8.02	7.54	7.78	8.48	6.33	7.40	11.94	11.76	11.85	9.01
T_4: RDN through Poultry manure(PM)	8.27	7.61	7.94	9.97	7.49	8.73	12.59	11.44	12.01	9.56
T_5: RDN through FYM+ Biofertilizer	8.32	8.62	8.47	9.33	8.27	8.80	12.33	10.86	11.59	9.62
T_6: RDN through Vermicompost+ Biofertilizer	8.45	8.14	8.30	10.90	9.49	10.20	12.13	12.75	12.44	10.31
T_7: RDN through Poultry manure + Biofertilizer	8.48	8.36	8.42	13.35	11.77	12.56	12.62	12.56	12.59	11.19
T_8: *** Cow based bio formulation	6.12	6.25	6.19	8.32	6.65	7.49	12.08	10.29	11.18	8.29
T_9: RDF**	14.64	13.52	14.08	17.71	15.57	16.64	11.74	11.75	11.74	14.15
CD at 5 %	1.57	0.88		2.93	1.95		1.39	1.37		
CV (%)	10.8	6.2		16.5	13.2		6.8	7.0		

Table II.62: PMAT 7A: Effect of organic and natural farming on straw yield of mustard crop in Pearl millet-mustard cropping system during Rabi 2022-23 and 2023-24 in Zone A

Treatment	Straw yield (q/ha)									Zonal mean
	HSR			JMR			JPR			
	2022-23	2023-24	Mean	2022-23	2023-24	Mean	2022-23	2023-24	Mean	
T_1:Control	23.84	27.47	25.66	13.88	12.16	13.02	19.45	18.99	19.22	19.30
T_2: RDN* through Farm yard manure (FYM)	30.89	34.79	32.84	17.25	13.99	15.62	25.77	25.35	25.56	24.67
T_3: RDN through Vermicompost (VC)	31.07	32.65	31.86	17.91	14.02	15.96	27.70	27.29	27.49	25.11
T_4: RDN through Poultry manure(PM)	31.23	33.49	32.36	19.64	15.72	17.68	29.08	28.67	28.88	26.31
T_5: RDN through FYM+ Biofertilizer	33.94	37.56	35.75	20.77	17.14	18.96	28.56	27.48	28.02	27.58
T_6: RDN through Vermicompost+ Biofertilizer	34.54	36.49	35.52	21.43	18.87	20.15	28.11	27.66	27.88	27.85
T_7: RDN through Poultry manure + Biofertilizer	34.94	37.09	36.02	24.03	21.58	22.81	29.25	28.83	29.04	29.29
T_8: *** Cow based bio formulation	25.77	31.17	28.47	18.66	14.23	16.45	28.00	27.58	27.79	24.24
T_9: RDF**	48.03	47.89	47.96	28.42	24.30	26.36	27.12	26.70	26.91	33.74
CD at 5 %	4.66	3.36		4.78	3.17		3.12	3.59		
CV (%)	8.2	5.4		13.5	10.8		6.6	7.7		

Table II.63: PMAT 7A: Effect of organic and natural farming on siliqua/plant, no. of siliqua in main shoot, plant height, siliqua length and oil content of mustard crop in Pearl millet-mustard cropping system during Rabi 2023-24 in Zone A

Treatment	Siliquae/plant				No. of siliquae on main shoot	Plant height (cm)	Length of silique (cm)	Oil content (%)
	HSR	JMR	JPR	Mean	HSR	JMR	JMR	HSR
T_1:Control	261.0	324.3	154.2	246.5	49.3	162.0	4.5	39.1
T_2: RDN* through Farm yard manure (FYM)	383.0	357.3	165.0	301.8	60.7	164.7	4.8	40.2
T_3: RDN through Vermicompost (VC)	359.0	354.7	183.2	298.9	56.3	169.7	5.2	39.6
T_4: RDN through Poultry manure(PM)	379.0	372.3	191.1	314.1	59.0	172.2	5.4	40.0
T_5: RDN through FYM+ Biofertilizer	400.0	379.3	167.8	315.7	63.0	174.3	5.4	40.4
T_6: RDN through Vermicompost+ Biofertilizer	384.0	400.0	190.1	324.7	61.7	179.1	5.5	40.2
T_7: RDN through Poultry manure + Biofertilizer	390.0	460.3	196.0	348.8	62.3	182.8	6.0	40.3
T_8: *** Cow based bio formulation	276.0	362.3	175.6	271.3	53.3	173.0	5.1	39.5
T_9: RDF**	541.0	513.0	170.7	408.2	89.0	189.3	6.1	40.5
CD at 5 %	33.0	71.8	15.6		6.2	13.6	0.8	NS
CV (%)	5.1	10.5	5.1		5.8	4.5	9.0	2.1

Table II.64: PMAT 7A: Effect of organic and natural farming on seeds/siliqua and test weight of mustard crop in Pearl millet-mustard cropping system during Rabi 2023-24 in Zone A

Treatment	No. of seeds/siliqua				Test weight (g)			
	HSR	JMR	JPR	Mean	HSR	JMR	JPR	Mean
T_1:Control	12.00	13.00	8.28	11.09	4.90	2.49	4.22	3.87
T_2: RDN* through Farm yard manure (FYM)	13.30	14.53	9.47	12.43	5.20	2.99	4.47	4.22
T_3: RDN through Vermicompost (VC)	12.90	14.67	10.87	12.81	5.10	2.74	4.79	4.21
T_4: RDN through Poultry manure(PM)	13.00	15.27	11.61	13.29	5.20	3.35	5.16	4.57
T_5: RDN through FYM+ Biofertilizer	14.40	15.47	11.07	13.65	5.50	3.43	4.95	4.63
T_6: RDN through Vermicompost+ Biofertilizer	14.20	15.60	11.97	13.92	5.30	3.13	5.22	4.55
T_7: RDN through Poultry manure + Biofertilizer	14.20	15.87	12.42	14.16	5.40	3.79	5.24	4.81
T_8: *** Cow based bio formulation	12.40	15.20	12.08	13.23	5.00	3.68	5.06	4.58
T_9: RDF**	15.60	17.80	12.16	15.19	5.60	4.55	5.12	5.09
CD at 5 %	0.90	2.18	0.81		0.30	0.62	0.45	
CV (%)	4.0	8.2	4.2		2.9	10.6	5.3	

Table II.65: PMAT 7A: Effect of organic and natural farming on yield attributes and PMEY of mustard crop in Pearl millet-mustard cropping system during Rabi 2023-24 in Zone A

Treatment	Primary branches per plant			Secondary branches per plant			PMEY (q/ha)
	JMR	JPR	Mean	JMR	JPR	Mean	HSR
T_1:Control	4.9	3.1	4.0	7.5	8.1	7.8	47.2
T_2: RDN* through Farm yard manure (FYM)	5.3	3.7	4.5	8.2	8.8	8.5	61.1
T_3: RDN through Vermicompost (VC)	5.4	4.7	5.1	8.7	10.7	9.7	61.8
T_4: RDN through Poultry manure(PM)	5.9	5.1	5.5	9.7	11.4	10.5	63.1
T_5: RDN through FYM+ Biofertilizer	6.0	4.7	5.3	10.1	10.3	10.2	66.0
T_6: RDN through Vermicompost+ Biofertilizer	6.7	5.1	5.9	10.3	10.7	10.5	66.0
T_7: RDN through Poultry manure + Biofertilizer	7.4	5.8	6.6	12.3	13.1	12.7	67.4
T_8: *** Cow based bio formulation	5.7	5.3	5.5	9.4	12.0	10.7	52.7
T_9: RDF**	9.1	5.2	7.2	15.5	11.6	13.6	87.8
CD at 5 %	1.1	0.7		2.5	1.9		-
CV (%)	9.8	8.2		14.2	10.0		-

Table II.66: PMAT 7A: Effect of organic and natural farming on soil OC, available NPK of soil and economics of mustard crop after harvest in Pearl millet-mustard cropping system during Rabi 2023-24 in Jamnagar Zone A

Treatment	Soil after harvest				Gross returns (Rs./ha)	Net returns (Rs./ha)	B:C
	OC (%)	Available N (kg/ha)	Available P (kg/ha)	Available K (kg/ha)			
T_1:Control	0.47	181.4	17.6	287.3	34088	11864	1.53
T_2: RDN* through Farm yard manure (FYM)	0.65	193.3	23.1	303.2	41235	14011	1.51
T_3: RDN through Vermicompost (VC)	0.61	195.5	22.6	311.0	46277	14053	1.44
T_4: RDN through Poultry manure(PM)	0.68	200.9	25.2	321.4	54714	26240	1.92
T_5: RDN through FYM+ Biofertilizer	0.70	188.6	24.6	316.2	60401	33177	2.22
T_6: RDN through Vermicompost+ Biofertilizer	0.67	201.3	25.2	318.5	69272	36898	2.14
T_7: RDN through Poultry manure + Biofertilizer	0.70	204.8	27.5	324.4	85751	57127	3.00
T_8: *** Cow based bio formulation	0.62	198.8	24.7	316.9	48592	21593	1.80
T_9: RDF**	0.44	225.0	27.3	314.9	94635	65936	3.30
CD at 5 %	0.07	17.1	3.6	20.5	-	-	-
CV (%)	6.2	4.9	8.5	3.7	-	-	-

Table II.67: PMAT 7B: Effect of organic and natural farming on grain yield of pearl millet crop during kharif 2022, 2023 and 2024 in Zone B

Treatment	Grain yield (q/ha)																				Zonal Mean
	ABD				DHL				VYP				CBE				PML				
	2022	2023	2024	Mean	2022	2023	2024	Mean	2022	2023	2024	Mean	2022	2023	2024	Mean	2022	2023	2024	Mean	
T_1:Control	19.38	15.04	14.1	16.18	10.65	13.30	14.63	12.86	17.16	16.45	14.38	15.99	17.49	17.49	16.24	17.07	12.29	14.35	13.40	13.35	**15.09**
T_2: RDN* through Farm yard manure (FYM)	20.72	17.90	17.4	18.66	15.59	20.99	21.23	19.27	22.56	19.87	21.11	21.18	20.28	20.28	19.53	20.03	21.94	24.16	23.19	23.10	**20.45**
T_3: RDN through Vermicompost (VC)	21.88	18.31	18.1	19.41	14.72	19.28	20.83	18.28	23.86	20.95	21.67	22.16	20.84	20.84	20.18	20.62	22.97	25.40	24.32	24.23	**20.94**
T_4: RDN through Poultry manure(PM)	22.83	18.43	18.3	19.85	14.09	18.96	19.37	17.47	22.24	20.62	20.56	21.14	19.68	19.68	19.24	19.53	23.92	29.54	25.11	26.19	**20.84**
T_5: RDN through FYM+ Biofertilizer	25.00	20.83	22.0	22.61	18.29	24.32	25.40	22.67	24.84	21.01	22.41	22.75	20.49	20.49	21.69	20.89	30.07	28.86	27.82	28.92	**23.57**
T_6: RDN through Vermicompost+ Biofertilizer	25.72	21.76	22.2	23.23	17.37	23.40	24.45	21.74	26.03	21.82	24.59	24.15	22.58	22.58	22.61	22.59	23.59	28.54	26.70	26.28	**23.60**
T_7: RDN through Poultry manure + Biofertilizer	26.39	22.36	23.4	24.04	16.72	22.12	23.10	20.65	23.93	21.65	20.16	21.91	23.41	23.41	22.11	22.98	27.40	27.96	26.90	27.42	**23.40**
T_8: *** Cow based bio formulation	22.43	18.29	19.2	19.98	12.85	17.95	18.85	16.55	21.61	19.81	19.84	20.42	22.85	22.85	24.39	23.37	22.92	23.33	14.39	20.22	**20.11**
T_9: RDF**	33.52	25.46	26.3	28.42	19.50	25.69	26.21	23.80	26.77	20.71	22.09	23.19	28.87	28.87	27.43	28.39	32.67	33.08	28.47	31.41	**27.04**
CD at 5 %	5.45	3.51	4.8		2.77	2.60	4.77		3.15	2.41	3.45		3.54	3.54	3.66		6.12	5.82	5.22		
CV (%)	12.9	10.1	13.7		10.2	7.2	12.7		7.8	6.8	9.5		9.3	9.3	9.7		14.5	12.7	12.8		

Table II.68: PMAT 7B: Effect of organic and natural farming on stover yield of pearl millet crop during kharif 2022, 2023 and 2024 in Zone B

Treatment	Stover yield (q/ha)																				Zonal Mean
	ABD				DHL				VYP				CBE				PML				
	2022	2023	2024	Mean	2022	2023	2024	Mean	2022	2023	2024	Mean	2022	2023	2024	Mean	2022	2023	2024	Mean	
T_1:Control	38.89	39.12	30.56	36.19	20.97	22.37	26.81	23.39	47.60	49.71	43.71	47.00	29.18	29.18	28.19	28.85	27.29	21.74	20.83	23.29	**31.74**
T_2: RDN* through Farm yard manure (FYM)	41.37	46.52	37.73	41.87	32.85	35.29	38.90	35.68	54.98	51.27	51.18	52.48	33.26	33.26	32.58	33.04	38.93	36.87	23.84	33.21	**39.26**
T_3: RDN through Vermicompost (VC)	43.66	47.61	39.82	43.69	29.97	32.49	38.16	33.54	55.12	52.55	49.54	52.40	32.66	32.66	33.64	32.99	41.71	37.80	36.80	38.77	**40.28**
T_4: RDN through Poultry manure(PM)	44.45	47.91	40.28	44.21	27.18	31.90	35.49	31.52	54.21	51.50	51.55	52.42	21.18	21.18	31.91	24.76	42.89	40.97	40.97	41.61	**38.90**
T_5: RDN through FYM+ Biofertilizer	46.87	55.21	43.29	48.46	35.42	40.91	46.54	40.96	57.29	53.61	52.59	54.50	31.23	31.23	33.94	32.13	48.43	44.31	44.61	45.78	**44.37**
T_6: RDN through Vermicompost+ Biofertilizer	47.34	57.66	47.45	50.82	33.80	39.35	44.79	39.31	59.54	54.70	54.07	56.10	34.57	34.57	34.59	34.58	46.81	40.07	45.83	44.24	**45.01**
T_7: RDN through Poultry manure + Biofertilizer	47.11	59.27	48.38	51.59	31.83	37.21	42.31	37.12	55.16	55.23	51.76	54.05	35.67	35.67	34.87	35.40	44.07	44.54	43.05	43.89	**44.41**
T_8: *** Cow based bio formulation	44.21	47.54	40.05	43.93	24.67	30.20	34.54	29.81	52.04	51.69	48.98	50.90	34.27	34.27	36.59	35.04	44.86	40.37	36.04	40.42	**40.02**
T_9: RDF**	58.10	66.20	57.41	60.57	37.05	43.21	48.02	42.76	61.25	52.39	51.25	54.96	40.28	40.28	41.25	40.60	53.15	48.61	46.99	49.58	**49.69**
CD at 5 %	7.45	9.21	9.05	8.57	8.10	4.35	8.74		6.02	NS	5.37		4.15	4.15	5.05		6.95	5.42	7.76		
CV (%)	9.3	10.2	12.1	10.5	15.3	7.2	12.7		6.2	5.5	6.1		7.3	7.3	8.5		9.2	7.9	11.8		

Table II.69: PMAT 7B: Effect of organic and natural farming on earhead girth, plant height, plant population and test weight of pearl millet crop during kharif 2024 in Zone B

Treatment	Earhead girth (mm)				Plant height (cm)						Plant population ('000/ha)					Test weight (g)					
	DHL	VYP	CBE	Mean	ABD	DHL	VYP	CBE	PML	Mean	ABD	CBE	VYP	PML	Mean	ABD	VYP	DHL	PML	CBE	Mean
T_1:Control	28.0	31.5	25.7	**28.4**	172.9	178.7	161.1	165.4	123.0	**160.2**	204.4	132.0	134.3	147.0	**154.4**	13.4	10.8	11.4	9.8	13.2	**11.7**
T_2: RDN* through Farm yard manure (FYM)	29.6	32.0	31.6	**31.1**	177.0	190.7	170.5	174.6	151.0	**172.7**	207.4	138.0	134.0	146.5	**156.5**	14.1	11.1	11.9	12.8	12.6	**12.5**
T_3: RDN through Vermicompost (VC)	29.3	32.6	31.9	**31.3**	181.2	184.3	175.5	176.4	165.0	**176.5**	209.0	141.0	137.3	147.3	**158.7**	14.5	11.4	12.0	13.0	13.9	**12.9**
T_4: RDN through Poultry manure(PM)	29.1	32.5	32.4	**31.4**	184.3	183.9	174.3	173.8	169.0	**177.1**	206.3	143.0	138.0	146.6	**158.5**	14.8	11.3	11.9	13.9	13.7	**13.1**
T_5: RDN through FYM+ Biofertilizer	29.8	33.4	35.5	**32.9**	189.5	187.0	179.1	186.4	167.0	**181.8**	207.4	145.0	136.6	148.1	**159.3**	14.8	12.0	12.1	14.2	14.4	**13.5**
T_6: RDN through Vermicompost+ Biofertilizer	29.5	34.1	35.9	**33.2**	191.2	186.7	180.1	185.7	174.0	**183.5**	205.6	146.0	135.2	148.2	**158.7**	15.0	12.2	11.9	14.7	14.8	**13.7**
T_7: RDN through Poultry manure + Biofertilizer	29.4	33.0	36.5	**33.0**	194.0	185.0	178.2	187.8	175.0	**184.0**	207.4	145.0	133.8	148.4	**158.6**	15.0	11.3	12.1	15.0	14.7	**13.6**
T_8: *** Cow based bio formulation	29.0	31.9	37.9	**32.9**	180.5	184.3	168.8	190.7	164.0	**177.7**	204.2	149.0	132.4	148.1	**158.4**	14.0	11.2	12.1	13.3	14.9	**13.1**
T_9: RDF**	29.9	33.2	39.5	**34.2**	192.8	192.7	177.6	193.4	178.0	**186.9**	207.4	151.0	134.7	148.5	**160.4**	15.8	12.1	12.2	15.1	14.4	**13.9**
CD at 5 %	1.0	NS	2.3		13.6	NS	8.9	10.3	8.1		NS	NS	NS	0.8		1.1	0.8	NS	1.1	1.0	
CV (%)	2.0	3.5	3.9		4.2	2.7	2.9	3.3	2.8		1.0	5.0	1.6	0.3		4.4	4.1	2.6	4.6	4.1	

Table II.70: PMAT 7B: Effect of organic and natural farming on totaltillers/plant, effective tillers/plant and earhead length of pearl millet crop during kharif 2024 in Zone B

Treatment	Total tillers/plant						Effective tillers/plant						Earhead Length (cm)			
	ABD	DHL	VYP	CBE	PML	Mean	ABD	DHL	VYP	CBE	PML	Mean	DHL	VYP	CBE	Mean
T_1:Control	3.0	3.0	3.1	3.6	2.5	**3.2**	1.9	1.7	2.5	2.7	1.5	**2.1**	17.4	17.1	22.7	**19.1**
T_2: RDN* through Farm yard manure (FYM)	4.2	3.7	3.3	4.5	3.7	**3.9**	3.1	2.5	2.5	3.6	2.5	**2.9**	20.4	18.9	25.9	**21.7**
T_3: RDN through Vermicompost (VC)	4.5	3.6	3.4	4.4	4.0	**4.0**	3.4	2.4	2.6	3.5	3.5	**3.1**	19.9	19.3	25.4	**21.5**
T_4: RDN through Poultry manure(PM)	4.5	3.4	3.3	4.4	3.7	**3.9**	3.5	2.4	2.7	3.5	3.5	**3.1**	19.6	19.0	25.7	**21.4**
T_5: RDN through FYM+ Biofertilizer	4.9	4.0	3.5	4.7	3.9	**4.3**	3.8	2.6	2.7	3.9	3.0	**3.2**	20.8	20.2	28.1	**23.0**
T_6: RDN through Vermicompost+ Biofertilizer	5.3	4.0	3.5	4.6	4.0	**4.3**	4.2	2.5	2.7	3.6	3.5	**3.3**	20.5	21.4	28.3	**23.4**
T_7: RDN through Poultry manure + Biofertilizer	5.4	3.6	3.3	4.7	4.2	**4.3**	4.5	2.4	2.6	3.7	3.8	**3.4**	20.4	19.5	28.7	**22.9**
T_8: *** Cow based bio formulation	4.4	3.4	3.3	4.8	3.5	**4.0**	3.3	2.4	2.5	4.1	2.0	**2.9**	20.2	18.6	30.6	**23.1**
T_9: RDF**	5.7	4.1	3.3	5.1	4.4	**4.6**	4.9	2.9	2.6	4.5	4.2	**3.8**	20.8	19.8	32.3	**24.3**
CD at 5 %	1.01	0.31	0.21	0.68	0.98		0.77	0.35	NS	0.69	0.43		0.7	1.2	2.9	
CV (%)	12.4	4.9	3.6	8.6	14.9		12.2	8.2	6.0	10.7	8.0		2.0	3.6	6.0	

Table II.71: PMAT 7B: Effect of organic and natural farming on gross returns of pearl millet crop during kharif 2022, 2023 and 2024 in Zone B

Treatment	Gross returns (Rs./ha)																Zonal Mean
	ABD				DHL				CBE				PML				
	2022	2023	2024	Mean	2022	2023	2024	Mean	2022	2023	2024	Mean	2022	2023	2024	Mean	
T_1:Control	59892	48780	47766	52146	28298	35042	38730	34023	32645	32645	74852	46714	39328	57413	48763	48501	45346
T_2: RDN* through Farm yard manure (FYM)	64006	58011	58762	60259	41603	55283	56196	51028	37797	37797	86440	54011	70208	96640	83287	83378	62169
T_3: RDN through Vermicompost (VC)	67578	59362	61227	62722	39197	50805	55118	48374	38689	38689	89000	55459	73515	101587	88679	87927	63621
T_4: RDN through Poultry manure(PM)	70322	59737	62002	64020	37394	49959	51265	46206	35569	35569	82953	51364	76530	118147	92543	95740	64332
T_5: RDN through FYM+ Biofertilizer	76719	67719	73530	72656	48556	64077	67230	59954	37950	37950	89535	55145	96235	115453	104024	105237	73248
T_6: RDN through Vermicompost+ Biofertilizer	78771	70728	75046	74849	46124	61632	64706	57487	41843	41843	91661	58449	75499	114160	103452	97704	72122
T_7: RDN through Poultry manure + Biofertilizer	80578	72700	78646	77308	44346	58277	61128	54584	43369	43369	92525	59754	87691	111853	106584	102043	73422
T_8: *** Cow based bio formulation	69200	59286	64688	64391	34092	47306	49899	43766	42278	42278	96616	60391	73344	93333	49392	72023	60143
T_9: RDF**	102053	82551	88987	91197	51720	67675	69374	62923	53107	53107	109167	71794	104563	132320	109106	115330	85311
CD at 5 %	15746	11393	14819		7301	6836	12632		-	-	-		19575	23262	19515		
CV (%)	12.1	10.1	12.5		10.1	7.2	12.7		-	-	-		14.5	12.7	12.8		

Table II.72: PMAT 7B: Effect of organic and natural farming on net returns of pearl millet crop during kharif 2022, 2023 and 2024 in Zone B

Treatment	Net returns (Rs./ha)																Zonal Mean
	ABD				DHL				CBE				PML				
	2022	2023	2024	Mean	2022	2023	2024	Mean	2022	2023	2024	Mean	2022	2023	2024	Mean	
T_1:Control	32892	21780	20266	24979	8781	13183	13811	11925	15745	15745	43452	24981	11828	18913	10263	13668	18888
T_2: RDN* through Farm yard manure (FYM)	33006	27011	27262	29093	16975	27699	24752	23142	-14103	-18331	42540	3369	39208	54140	40787	44712	25079
T_3: RDN through Vermicompost (VC)	36078	27862	29227	31056	4628	12088	10981	9232	-6171	-6171	34670	7443	41014	58753	45679	48482	24053
T_4: RDN through Poultry manure(PM)	38322	27737	29502	31854	12809	22424	19875	18369	-4665	-4665	28219	6296	43030	74647	49043	55573	28023
T_5: RDN through FYM+ Biofertilizer	45219	36219	41530	40989	23903	36466	35753	32041	-14550	-14550	44785	5228	64435	72453	61024	65971	36057
T_6: RDN through Vermicompost+ Biofertilizer	46771	38728	42546	42682	11530	22886	20536	18317	-3617	-3617	37051	9939	42199	70660	59952	57604	32135
T_7: RDN through Poultry manure + Biofertilizer	48078	40200	45646	44641	19734	30712	29704	26717	2535	-26874	42541	6067	53491	67853	62584	61309	34684
T_8: *** Cow based bio formulation	40200	30286	35188	35225	12633	23272	22500	19468	15378	15378	60216	30324	44344	53833	21059	39745	31191
T_9: RDF**	72053	52551	57987	60864	29761	43081	41337	38060	21197	21197	70267	37554	74563	90820	67606	77663	53535
CD at 5 %	15746	11393	14819		7301	6837	12632		-	-	-		19574	23283	19460		
CV (%)	20.7	19.4	23.2		26.7	15.2	29.7		-	-	-		24.4	21.4	24.0		

Table II.73: PMAT 7B: Effect of organic and natural farming on BC ratio of pearl millet crop during kharif 2022, 2023 and 2024 in Zone B

Treatment	BC ratio (%)																Zonal Mean
	ABD				DHL				CBE				PML				
	2022	2023	2024	Mean	2022	2023	2024	Mean	2022	2023	2024	Mean	2022	2023	2024	Mean	
T_1:Control	2.22	1.80	1.74	1.92	1.45	1.60	1.55	1.54	1.93	1.93	2.38	2.08	1.43	1.49	1.26	1.39	1.73
T_2: RDN* through Farm yard manure (FYM)	2.06	1.87	1.87	1.93	1.69	2.01	1.79	1.83	0.73	0.67	1.97	1.12	2.26	2.27	1.95	2.16	1.76
T_3: RDN through Vermicompost (VC)	2.14	1.88	1.91	1.98	1.14	1.31	1.25	1.23	0.86	0.86	1.64	1.12	2.26	2.36	2.06	2.23	1.64
T_4: RDN through Poultry manure(PM)	2.20	1.87	1.91	1.99	1.52	1.81	1.63	1.66	0.88	0.88	1.52	1.09	2.29	2.71	2.12	2.37	1.78
T_5: RDN through FYM+ Biofertilizer	2.43	2.15	2.30	2.29	1.97	2.32	2.14	2.14	0.72	0.72	2.00	1.15	3.02	2.68	2.42	2.71	2.07
T_6: RDN through Vermicompost+ Biofertilizer	2.46	2.21	2.31	2.33	1.33	1.59	1.46	1.46	0.92	0.92	1.68	1.17	2.27	2.63	2.37	2.42	1.85
T_7: RDN through Poultry manure + Biofertilizer	2.48	2.24	2.38	2.36	1.80	2.12	1.95	1.96	1.06	0.62	1.85	1.18	2.56	2.54	2.42	2.51	2.00
T_8: *** Cow based bio formulation	2.39	2.04	2.19	2.21	1.59	1.97	1.82	1.79	1.57	1.57	2.65	1.93	2.53	2.36	1.73	2.21	2.03
T_9: RDF**	3.40	2.75	2.87	3.01	2.36	2.75	2.47	2.53	1.66	1.66	2.81	2.04	3.48	3.19	2.62	3.10	2.67
CD at 5 %	0.52	0.37	0.49		0.28	0.24	0.39		-	-	-		0.62	0.56	0.46		
CV (%)	12.4	10.1	12.9		9.7	7.0	12.5		-	-	-		14.6	13.0	12.6		

Table II.74: PMAT 7B: Effect of organic and natural farming on chemical properties of soil after harvesting of pearl millet during kharif 2022, 2023 and 2024 in Zone B

Treatment	After harvest																			
	pH									Zonal Mean	EC (ds/m)									Zonal Mean
	DHL	VYP				PML					DHL	VYP				PML				
	2022	2022	2023	2024	Mean	2022	2023	2024	Mean		2022	2022	2023	2024	Mean	2022	2023	2024	Mean	
T_1:Control	7.90	8.21	8.21	8.17	8.20	7.49	7.50	7.46	7.48	7.86	0.42	0.32	0.33	0.33	0.33	0.47	0.44	0.47	0.46	0.40
T_2: RDN* through Farm yard manure (FYM)	7.86	8.22	8.21	8.18	8.20	7.49	7.51	7.55	7.52	7.86	0.39	0.33	0.32	0.33	0.33	0.45	0.50	0.48	0.47	0.40
T_3: RDN through Vermicompost (VC)	7.88	8.22	8.23	8.20	8.22	7.54	7.50	7.54	7.53	7.87	0.39	0.33	0.32	0.32	0.33	0.50	0.47	0.51	0.49	0.40
T_4: RDN through Poultry manure(PM)	7.90	8.22	8.22	8.21	8.22	7.56	7.53	7.42	7.50	7.87	0.42	0.33	0.31	0.34	0.32	0.50	0.48	0.49	0.49	0.41
T_5: RDN through FYM+ Biofertilizer	7.86	8.20	8.22	8.19	8.21	7.52	7.46	7.57	7.52	7.86	0.39	0.33	0.33	0.33	0.33	0.53	0.47	0.54	0.51	0.41
T_6: RDN through Vermicompost+ Biofertilizer	7.88	8.20	8.23	8.20	8.21	7.54	7.54	7.47	7.52	7.87	0.39	0.33	0.32	0.33	0.33	0.51	0.49	0.53	0.51	0.41
T_7: RDN through Poultry manure + Biofertilizer	7.90	8.23	8.23	8.16	8.20	7.46	7.51	7.55	7.51	7.87	0.42	0.34	0.32	0.33	0.33	0.50	0.45	0.50	0.48	0.41
T_8: *** Cow based bio formulation	7.88	8.16	8.20	8.17	8.18	7.55	7.50	7.53	7.53	7.86	0.41	0.32	0.33	0.32	0.33	0.48	0.48	0.54	0.50	0.41
T_9: RDF**	7.92	8.27	8.23	8.18	8.23	7.44	7.54	7.58	7.52	7.89	0.43	0.33	0.34	0.33	0.33	0.50	0.46	0.52	0.50	0.42
CD at 5 %	-	NS	NS	NS		NS	NS	NS			-	NS	0.01	NS		NS	NS	NS		
CV (%)	-	0.8	0.4	1.0		1.2	0.7	2.1			-	2.5	2.1	2.3		5.5	7.1	9.8		

Table II.75: PMAT 7B: Effect of organic and natural farming on available N and P of soil after harvesting of pearl millet during kharif 2022, 2023 and 2024 in Zone B

Treatment	Available N&P after harvest (kg/ha)																			
	Available N									Zonal Mean	Available P									Zonal Mean
	DHL	VYP				PML					DHL	VYP				PML				
	2022	2022	2023	2024	Mean	2022	2023	2024	Mean		2022	2022	2023	2024	Mean	2022	2023	2024	Mean	
T_1:Control	178.7	182.1	174.2	174.4	176.9	183.9	221.7	209.0	204.9	186.8	16.3	18.7	18.2	18.3	18.4	58.8	34.3	35.3	42.8	25.8
T_2: RDN* through Farm yard manure (FYM)	213.4	212.2	203.5	205.3	207.0	196.5	238.3	246.7	227.2	215.8	17.1	21.2	23.3	23.6	22.7	59.5	39.7	37.3	45.5	28.5
T_3: RDN through Vermicompost (VC)	209.2	223.2	210.5	212.8	215.5	188.1	250.7	254.7	231.1	218.6	17.1	21.7	24.2	23.1	23.0	68.7	41.7	39.7	50.0	30.0
T_4: RDN through Poultry manure(PM)	202.5	208.4	205.4	207.7	207.1	192.3	246.7	242.7	227.2	212.3	16.9	20.8	24.3	24.1	23.0	60.3	44.7	44.3	49.8	29.9
T_5: RDN through FYM+ Biofertilizer	213.7	221.5	211.1	211.1	214.6	183.9	250.7	234.3	223.0	217.1	17.2	21.9	24.6	24.4	23.6	56.5	42.0	42.7	47.1	29.3
T_6: RDN through Vermicompost+ Biofertilizer	210.7	223.7	215.6	215.9	218.4	204.8	234.0	246.7	228.5	219.2	17.1	22.1	25.4	25.2	24.2	67.6	49.3	52.7	56.5	32.6
T_7: RDN through Poultry manure + Biofertilizer	203.4	219.5	212.2	218.6	216.8	217.4	255.0	242.3	238.2	219.5	17.0	21.0	24.8	24.4	23.4	67.2	47.7	53.0	55.9	32.1
T_8: *** Cow based bio formulation	206.2	215.6	192.1	193.7	200.5	167.2	276.0	242.3	228.5	211.7	16.4	22.0	22.7	22.7	22.5	68.1	40.0	58.3	55.5	31.4
T_9: RDF**	197.3	211.5	179.4	182.9	191.3	209.0	242.3	263.3	238.2	208.9	17.2	20.7	21.7	21.4	21.3	67.9	39.7	55.0	54.2	30.9
CD at 5 %	-	15.6	11.4	10.8		NS	NS	21.1			-	1.9	2.0	2.3		9.0	4.4	7.6		
CV (%)	-	4.2	3.2	3.1		9.1	8.7	5.0			-	5.2	5.0	5.7		8.1	6.0	9.3		

Table II.76: PMAT 7B: Effect of organic and natural farming on available K and OC of soil after harvesting of pearl millet during kharif 2022, 2023 and 2024 in Zone B

Treatment	Available K (kg/ha) and OC (%) after harvest																			
	Available K									Zonal Mean	OC (%)									Zonal Mean
	DHL	VYP				PML					DHL	VYP				PML				
	2022	2022	2023	2024	Mean	2022	2023	2024	Mean		2022	2022	2023	2024	Mean	2022	2023	2024	Mean	
T_1:Control	542.0	389.7	383.0	377.8	383.5	221.3	167.7	175.3	188.1	371.2	0.48	0.65	0.62	0.60	0.63	0.49	0.36	0.39	0.41	0.51
T_2: RDN* through Farm yard manure (FYM)	556.0	411.5	415.9	417.6	415.0	239.0	179.0	188.7	202.2	391.1	0.58	0.71	0.68	0.68	0.69	0.51	0.42	0.43	0.45	0.57
T_3: RDN through Vermicompost (VC)	556.0	416.6	418.2	422.2	419.0	220.3	194.7	229.3	214.8	396.6	0.56	0.68	0.69	0.70	0.69	0.50	0.43	0.43	0.45	0.57
T_4: RDN through Poultry manure(PM)	552.0	402.3	410.2	413.8	408.8	248.0	192.3	201.7	214.0	391.6	0.56	0.68	0.68	0.68	0.68	0.51	0.42	0.43	0.45	0.56
T_5: RDN through FYM+ Biofertilizer	558.0	423.5	417.4	419.2	420.0	233.7	190.3	204.7	209.6	395.9	0.58	0.70	0.69	0.70	0.69	0.50	0.44	0.45	0.46	0.58
T_6: RDN through Vermicompost+ Biofertilizer	556.0	428.5	421.3	425.5	425.1	258.0	203.0	206.7	222.6	401.2	0.56	0.71	0.70	0.69	0.70	0.50	0.44	0.47	0.47	0.58
T_7: RDN through Poultry manure + Biofertilizer	556.0	408.8	411.3	412.1	410.8	219.0	204.7	210.7	211.4	392.7	0.56	0.68	0.68	0.69	0.68	0.50	0.46	0.46	0.48	0.57
T_8: *** Cow based bio formulation	557.0	414.9	406.9	396.8	406.2	272.3	172.7	187.7	210.9	391.4	0.57	0.67	0.62	0.64	0.64	0.51	0.43	0.45	0.46	0.56
T_9: RDF**	568.0	395.1	390.7	387.3	391.0	213.0	199.3	198.0	203.4	387.5	0.56	0.66	0.62	0.62	0.63	0.50	0.42	0.41	0.44	0.55
CD at 5 %	-	22.1	8.8	NS		23.5	19.5	27.0			-	NS	0.03	0.04		NS	NS	NS		
CV (%)	-	3.1	1.2	5.4		5.7	5.9	7.7			-	5.4	3.0	3.5		2.3	11.7	16.2		

Table II.77: PMAT 7B: Effect of organic and natural farming on protein, Fe & Zn content of pearl millet during kharif 2022, 2023 and 2024 in Zone B

Treatment	Protein content (%)						Fe (mg/kg)				Zn (mg/kg)			
	VYP			CBE			VYP							
	2023	2024	Mean	2023	2024	Mean	2022	2023	2024	Mean	2022	2023	2024	Mean
T_1:Control	11.64	10.49	11.06	9.32	9.45	9.39	8.04	8.56	8.76	8.45	0.70	0.61	0.59	0.63
T_2: RDN* through Farm yard manure (FYM)	12.66	11.89	12.28	11.37	11.49	11.43	10.39	9.82	10.48	10.23	0.77	0.68	0.68	0.72
T_3: RDN through Vermicompost (VC)	13.10	13.12	13.11	12.06	12.12	12.09	9.92	10.08	10.91	10.30	0.73	0.70	0.71	0.71
T_4: RDN through Poultry manure(PM)	13.33	13.49	13.41	11.84	11.95	11.89	9.03	9.46	10.15	9.55	0.71	0.65	0.66	0.68
T_5: RDN through FYM+ Biofertilizer	13.56	13.00	13.28	11.63	11.78	11.71	10.61	10.01	10.89	10.50	0.75	0.70	0.68	0.71
T_6: RDN through Vermicompost+ Biofertilizer	13.74	13.68	13.71	12.02	12.08	12.05	10.78	10.27	11.53	10.86	0.75	0.69	0.70	0.72
T_7: RDN through Poultry manure + Biofertilizer	14.03	13.87	13.95	11.53	11.63	11.58	9.40	9.90	10.67	9.99	0.70	0.67	0.67	0.68
T_8: *** Cow based bio formulation	12.49	12.13	12.31	11.86	11.95	11.91	10.03	9.62	9.97	9.88	0.71	0.63	0.66	0.67
T_9: RDF**	13.11	12.93	13.02	11.76	11.83	11.80	11.21	8.90	9.68	9.93	0.78	0.64	0.63	0.68
CD at 5 %	1.21	1.75		0.41	0.53		NS	NS	NS		NS	0.06	NS	
CV (%)	5.3	7.9		2.1	2.6		13.5	8.7	8.7		9.7	4.9	6.3	

Table II.78: PMAT 7B: Effect of organic and natural farming on bacterial & fungi counts of soil after harvest of pearl millet during kharif 2022, 2023 and 2024 in Zone B

Treatment	Bacteria (10^6 CFU/ml)								Fungi (10^4 CFU/ml)			
	VYP				PML				PML			
	2022	2023	2024	Mean	2022	2023	2024	Mean	2022	2023	2024	Mean
T_1:Control	30.67	38.67	34.00	34.44	3.33	7.00	7.67	6.00	6.00	3.00	3.67	4.22
T_2: RDN* through Farm yard manure (FYM)	36.00	51.67	59.00	48.89	3.67	10.00	11.33	8.33	11.00	4.33	5.67	7.00
T_3: RDN through Vermicompost (VC)	38.67	52.00	64.33	51.67	8.33	8.67	9.00	8.67	14.00	6.00	8.00	9.33
T_4: RDN through Poultry manure(PM)	33.33	43.67	55.67	44.22	12.67	8.33	9.33	10.11	8.67	5.33	7.00	7.00
T_5: RDN through FYM+ Biofertilizer	42.33	49.33	64.33	52.00	11.00	10.33	11.00	10.78	10.67	5.67	7.00	7.78
T_6: RDN through Vermicompost+ Biofertilizer	47.00	51.67	73.67	57.44	9.33	11.00	12.33	10.89	11.67	6.67	8.00	8.78
T_7: RDN through Poultry manure + Biofertilizer	34.00	48.67	59.00	47.22	12.33	10.00	11.33	11.22	13.00	5.67	6.33	8.33
T_8: *** Cow based bio formulation	42.00	46.33	65.33	51.22	13.00	11.67	12.33	12.33	6.67	6.00	6.67	6.44
T_9: RDF**	36.33	40.33	43.33	40.00	5.33	8.67	8.67	7.56	6.67	4.33	4.33	5.11
CD at 5 %	NS	NS	20.32		4.17	1.41	1.46		2.64	1.16	1.55	
CV (%)	19.0	11.7	20.2		27.2	8.5	8.1		15.4	12.8	14.1	

Table II.79: PMAT 7B: Effect of organic and natural farming on seed yield of chickpea crop in Pearl millet-chickpea cropping sysytem during Rabi 2022-23 and 2023-24 in Zone B

Treatment	Seed yield (q/ha)										Zonal mean
	VYP			CBE			PML			DHL	
	2022-23	2023-24	Mean	2022-23	2023-24	Mean	2023-24	2024-25	Mean	2023-24	
T_1:Control	10.73	10.82	10.78	6.52	6.88	6.70	14.99	6.86	10.93	7.90	10.09
T_2: RDN* through Farm yard manure (FYM)	14.63	12.38	13.51	10.26	10.89	10.58	16.32	8.65	12.49	11.64	13.01
T_3: RDN through Vermicompost (VC)	16.27	13.15	14.71	10.38	10.73	10.55	16.99	9.20	13.10	10.79	13.26
T_4: RDN through Poultry manure(PM)	15.54	13.01	14.28	10.63	10.68	10.66	17.05	9.83	13.44	9.51	12.87
T_5: RDN through FYM+ Biofertilizer	17.31	14.46	15.88	11.11	11.45	11.28	19.53	12.98	16.26	14.43	15.28
T_6: RDN through Vermicompost+ Biofertilizer	18.65	15.11	16.88	11.08	11.26	11.17	19.53	12.72	16.13	13.57	15.29
T_7: RDN through Poultry manure + Biofertilizer	17.60	15.04	16.32	11.42	11.19	11.31	19.56	13.88	16.72	12.82	15.00
T_8: *** Cow based bio formulation	14.99	13.13	14.06	12.62	12.91	12.77	17.32	8.40	12.86	9.34	13.37
T_9: RDF**	17.18	14.04	15.61	13.55	14.08	13.82	20.22	13.84	17.03	16.18	16.46
CD at 5 %	2.86	1.45		2.02	1.77		NS	1.62		1.30	
CV (%)	10.3	6.2		10.7	9.1		11.8	8.7		6.3	

Table II.80: PMAT 7B: Effect of organic and natural farming on straw yield of chickpea crop in Pearl millet-chickpea cropping sysytem during Rabi 2022-23 and 2023-24 in Zone B

Treatment	Straw yield (q/ha)										Zonal mean
	VYP			CBE			PML			DHL	
	2022-23	2023-24	Mean	2022-23	2023-24	Mean	2023-24	2024-25	Mean	2023-24	
T_1:Control	15.95	17.67	16.81	8.01	10.72	9.36	-	-	-	13.71	13.29
T_2: RDN* through Farm yard manure (FYM)	21.69	20.70	21.19	11.81	13.45	12.63	-	-	-	20.20	18.01
T_3: RDN through Vermicompost (VC)	22.61	21.31	21.96	12.06	13.24	12.65	-	-	-	18.71	17.78
T_4: RDN through Poultry manure(PM)	21.82	20.85	21.34	11.94	13.18	12.56	-	-	-	16.50	16.80
T_5: RDN through FYM+ Biofertilizer	22.51	21.69	22.10	12.68	14.29	13.49	-		-	25.04	20.21
T_6: RDN through Vermicompost+ Biofertilizer	24.01	22.15	23.08	12.43	13.33	12.88	-	-	-	23.54	19.83
T_7: RDN through Poultry manure + Biofertilizer	20.21	21.12	20.67	12.84	13.39	13.12	-	-	-	22.24	18.67
T_8: *** Cow based bio formulation	20.12	19.62	19.87	14.35	15.46	14.91	-	-	-	16.20	16.99
T_9: RDF**	25.04	19.94	22.49	15.27	17.05	16.16	-	-	-	28.07	22.24
CD at 5 %	NS	NS		1.71	2.02		-	-	-	2.25	
CV (%)	14.0	8.6		7.9	8.4		-	-	-	6.3	

Table II.81: PMAT 7B: Effect of organic and natural farming on growth and yield attributes of chickpea crop in pearl millet-chickpea cropping sysytem during Rabi 2023-24 in Zone B

Treatment	Plant height (cm)				No of primary branches/plant				No of secondary branches/plant				Number of pods/plant			
	VYP	CBE	PML	Mean	VYP	CBE	PML	Mean	VYP	CBE	PML	Mean	VYP	CBE	PML	Mean
T_1:Control	26.9	22.4	40.9	30.0	1.9	2.5	2.0	2.2	6.2	7.8	15.3	9.8	23.2	29.4	29.3	27.3
T_2: RDN* through Farm yard manure (FYM)	30.7	29.2	45.3	35.1	2.3	3.2	2.9	2.8	7.0	9.8	17.2	11.3	32.5	40.1	30.8	34.5
T_3: RDN through Vermicompost (VC)	31.0	29.4	46.2	35.5	2.4	3.1	2.8	2.8	7.5	9.9	18.9	12.1	34.6	41.0	32.3	36.0
T_4: RDN through Poultry manure(PM)	29.8	29.6	45.9	35.1	2.3	3.2	2.6	2.7	7.5	9.9	16.5	11.3	33.2	41.4	35.6	36.7
T_5: RDN through FYM+ Biofertilizer	31.4	35.6	50.2	39.1	2.4	3.4	2.8	2.9	7.5	10.6	21.3	13.1	34.3	46.6	46.0	42.3
T_6: RDN through Vermicompost+ Biofertilizer	32.8	36.8	49.0	39.5	2.4	3.4	2.6	2.8	7.6	10.3	19.2	12.4	35.0	47.1	43.6	41.9
T_7: RDN through Poultry manure + Biofertilizer	30.7	38.1	49.2	39.3	2.3	3.5	2.9	2.9	7.5	10.2	21.0	12.9	33.6	47.7	46.3	42.5
T_8: *** Cow based bio formulation	30.7	42.2	47.2	40.0	2.3	3.6	2.5	2.8	7.2	11.3	19.5	12.7	32.5	50.2	38.2	40.3
T_9: RDF**	31.1	45.9	52.0	43.0	2.3	3.9	2.9	3.0	7.3	13.5	23.8	14.9	32.3	51.7	48.3	44.1
CD at 5 %	NS	6.1	NS		0.2	0.5	NS		0.4	NS	2.2		2.1	4.5	4.8	
CV (%)	6.0	10.2	7.5		4.9	7.8	21.9		3.5	20.4	6.5		3.6	5.8	7.0	

Table II.82: PMAT 7B: Effect of organic and natural farming on growth and yield attributes of chickpea crop in pearl millet-chickpea cropping sysytem during Rabi 2023-24 in Zone B

Treatment	Number of seeds/pod				Seed index (g) (100 seed weight)				Protein content (%)				Plant population (000/ha)			
	VYP	CBE	PML	Mean	VYP	CBE	PML	Mean	VYP	CBE	PML	Mean	VYP	CBE	PML	Mean
T_1:Control	1.9	1.4	-	1.6	28.5	18.8	20.6	22.6	21.5	22.5	-	22.0	-	326.0	-	326.0
T_2: RDN* through Farm yard manure (FYM)	1.9	1.5	-	1.7	30.8	24.2	21.3	25.4	22.9	25.3	-	24.1	-	338.7	-	338.7
T_3: RDN through Vermicompost (VC)	2.0	1.5	-	1.8	31.1	23.9	20.6	25.2	23.1	26.1	-	24.6	-	340.7	-	340.7
T_4: RDN through Poultry manure(PM)	1.9	1.6	-	1.8	31.0	23.4	21.3	25.2	23.0	27.2	-	25.1	-	327.0	-	327.0
T_5: RDN through FYM+ Biofertilizer	2.0	1.6	-	1.8	31.2	28.2	22.0	27.1	23.3	27.4	-	25.4	-	327.7	-	327.7
T_6: RDN through Vermicompost+ Biofertilizer	2.0	1.7	-	1.8	31.0	28.7	22.4	27.4	23.4	28.2	-	25.8	-	335.7	-	335.7
T_7: RDN through Poultry manure + Biofertilizer	1.9	1.7	-	1.8	31.4	29.1	21.5	27.3	23.6	28.6	-	26.1	-	339.7	-	339.7
T_8: *** Cow based bio formulation	1.9	1.7	-	1.8	30.4	31.5	22.0	28.0	22.9	29.1	-	26.0	-	341.7	-	341.7
T_9: RDF**	1.9	1.9	-	1.9	30.2	31.8	23.9	28.6	22.4	29.7	-	26.0	-	337.7	-	337.7
CD at 5 %	NS	0.1	-		NS	4.2	1.8		NS	3.7	-		-	NS	-	
CV (%)	4.8	2.8	-		3.2	9.1	4.7		5.0	7.7	-		-	4.9	-	

Table II.83: PMAT 7B: Effect of organic and natural farming on soil vailable NPK after harvesting of chickpea crop in Pearl millet-chickpea cropping sysytem during Rabi 2022-23 and 2023-24 in Coimbatore in Zone B

Treatment	Soil available N (kg/ha)			Soil available P (kg/ha)			Soil available K (kg/ha)		
	CBE			CBE			CBE		
	2022-23	2023-24	Mean	2022-23	2023-24	Mean	2022-23	2023-24	Mean
T_1:Control	224.0	193.0	208.5	8.00	10.00	9.00	357.7	443.0	400.3
T_2: RDN* through Farm yard manure (FYM)	272.3	207.0	239.7	18.00	19.00	18.50	437.3	513.0	475.2
T_3: RDN through Vermicompost (VC)	246.0	209.0	227.5	16.67	18.00	17.33	453.7	518.0	485.8
T_4: RDN through Poultry manure(PM)	243.3	213.0	228.2	17.33	18.00	17.67	462.3	524.0	493.2
T_5: RDN through FYM+ Biofertilizer	234.0	225.0	229.5	14.00	15.00	14.50	512.3	548.0	530.2
T_6: RDN through Vermicompost+ Biofertilizer	240.7	237.0	238.8	14.67	16.00	15.33	533.7	552.0	542.8
T_7: RDN through Poultry manure + Biofertilizer	262.3	242.0	252.2	14.33	15.00	14.67	548.0	564.0	556.0
T_8: *** Cow based bio formulation	257.7	248.0	252.8	14.67	16.00	15.33	561.7	572.0	566.8
T_9: RDF**	250.3	264.0	257.2	14.00	15.00	14.50	574.3	567.0	570.7
CD at 5 %	NS	34.6		2.77	4.37		40.0	41.5	
CV (%)	7.8	8.8		10.9	15.9		4.6	4.5	

Table II.84: PMAT 7B: Effect of organic and natural farming on soil OC, pH and EC after harvesting of chickpea crop in Pearl millet-chickpea cropping sysytem during Rabi 2022-23 and 2023-24 in Coimbatore in Zone B

Treatment	Soil OC at harvest (%)			Soil pH at harvest (kg/ha)			Soil EC at harvest (dSm-1)		
	CBE			CBE			CBE		
	2022-23	2023-24	Mean	2022-23	2023-24	Mean	2022-23	2023-24	Mean
T_1:Control	0.41	0.41	0.41	8.38	0.41	4.40	0.35	0.38	0.37
T_2: RDN* through Farm yard manure (FYM)	0.42	0.43	0.42	8.24	0.43	4.33	0.36	0.35	0.35
T_3: RDN through Vermicompost (VC)	0.41	0.42	0.41	8.28	0.42	4.35	0.35	0.34	0.35
T_4: RDN through Poultry manure(PM)	0.42	0.43	0.42	8.27	0.43	4.35	0.34	0.33	0.34
T_5: RDN through FYM+ Biofertilizer	0.42	0.43	0.42	8.19	0.43	4.31	0.35	0.34	0.34
T_6: RDN through Vermicompost+ Biofertilizer	0.42	0.43	0.43	8.16	0.43	4.30	0.35	0.34	0.34
T_7: RDN through Poultry manure + Biofertilizer	0.43	0.43	0.43	8.15	0.43	4.29	0.34	0.33	0.34
T_8: *** Cow based bio formulation	0.43	0.44	0.43	8.13	0.44	4.28	0.35	0.34	0.35
T_9: RDF**	0.42	0.41	0.41	8.41	0.41	4.41	0.36	0.37	0.37
CD at 5 %	0.01	0.02		0.08	0.02		0.01	0.02	
CV (%)	1.4	2.3		0.5	2.3		1.5	3.3	

Table II.85: PMAT 7B: Effect of organic and natural farming on economics after harvesting of chickpea crop in Pearl millet-chickpea cropping sysytem during Rabi 2022-23, 2023-24 and 2024-25 in Zone B

Treatment	Gross Returns (Rs./ha)					Zonal mean	Net Returns (Rs./ha)					Zonal mean	B:C ratio					Zonal mean
	CBE			DHL	PML		CBE			DHL	PML		CBE			DHL	PML	
	2022-23	2023-24	Mean	2023-24	2024-25		2022-23	2023-24	Mean	2023-24	2024-25		2022-23	2023-24	Mean	2023-24	2024-25	
T_1:Control	50846	56317	53582	75253	34300	64417	25446	28917	27182	30648	5550	28915	2.00	2.06	2.03	1.69	1.19	1.86
T_2: RDN* through Farm yard manure (FYM)	59383	88330	73857	109996	43250	91926	18891	45838	32365	54391	14483	43378	1.47	2.08	1.78	1.98	1.50	1.88
T_3: RDN through Vermicompost (VC)	60106	86979	73543	104970	46000	89256	22154	47027	34591	28108	17233	31349	1.58	2.18	1.88	1.37	1.60	1.62
T_4: RDN through Poultry manure(PM)	61450	86626	74038	95222	49150	84630	25118	48294	36706	39805	20400	38256	1.69	2.26	1.98	1.72	1.69	1.85
T_5: RDN through FYM+ Biofertilizer	64294	92882	78588	133930	64900	106259	20610	47198	33904	78200	36150	56052	1.47	2.03	1.75	2.40	2.25	2.08
T_6: RDN through Vermicompost+ Biofertilizer	64028	91161	77595	127395	63600	102495	22884	48017	35451	50495	34583	42973	1.56	2.11	1.84	1.66	2.21	1.75
T_7: RDN through Poultry manure + Biofertilizer	66021	90656	78339	120362	69400	99350	26497	49132	37815	64927	40650	51371	1.67	2.18	1.93	2.17	2.42	2.05
T_8: *** Cow based bio formulation	72998	104589	88794	93064	42000	90929	37598	67189	52394	44201	13217	48297	2.06	2.80	2.43	1.90	1.46	2.17
T_9: RDF**	78362	114113	96238	144152	69200	120195	40040	73791	56916	94249	40450	75582	2.04	2.83	2.44	2.89	2.40	2.66
CD at 5 %	-	-		12002	8093		-			12057	8189		-			0.22	0.29	
CV (%)	-	-		6.2	8.7		-			12.8	19.0		-			6.4	9.0	

Table II.86: PMAT 7B: Effect of organic and natural farming on gross returns, net returns and BC ratio of Pearlmillet-chickpea cropping sequence during 2024-25 in Perumallapalle and total PM equivalent yield of sequence in Dhule during 2023-24 in Zone B

Treatment	Gross returns, Net returns and BC ratio of Pearlmillet-chickpea cropping sequence			Total PM equivalent yield of sequence
	PML GR	PML NR	PML B:C	DHL 2023-24
T_1:Control	83063	15813	1.23	30.10
T_2: RDN* through Farm yard manure (FYM)	126537	55270	1.77	44.00
T_3: RDN through Vermicompost (VC)	134696	62912	1.88	41.99
T_4: RDN through Poultry manure(PM)	141693	69443	1.91	38.09
T_5: RDN through FYM+ Biofertilizer	176367	97174	1.93	53.57
T_6: RDN through Vermicompost+ Biofertilizer	168171	94535	2.28	50.96
T_7: RDN through Poultry manure + Biofertilizer	178200	103234	2.39	48.15
T_8: *** Cow based bio formulation	93469	34275	1.58	37.22
T_9: RDF**	172098	108056	2.72	57.66
CD at 5 %	15692	19532	0.46	4.80
CV (%)	6.3	15.7	13.4	6.2