

Table (3): Grain and straw yields of wheat (ton/fad) as affected by P-biofertilizer and application of chemical P-fertilizers.

| Treatments | Grain yield | | | Straw yield | | |
|------------------------------------|---------------|-------------|-------|---------------|-------------|-------|
| | Uninoculation | Inoculation | Mean | Uninoculation | Inoculation | Mean |
| Control | 2.782 | 3.124 | 2.953 | 7.240 | 8.684 | 7.962 |
| P rates (kg/fad.)as Super-P | | | | | | |
| 3.25 | 2.982 | 3.258 | 3.120 | 8.182 | 9.166 | 8.674 |
| 6.50 | 3.200 | 3.440 | 3.320 | 8.832 | 9.494 | 9.163 |
| 9.75 | 3.384 | 3.628 | 3.506 | 9.194 | 9.708 | 9.451 |
| 13.00 | 3.354 | 3.572 | 3.463 | 9.340 | 9.714 | 9.527 |
| P rates (kg/fad.)as Rock-P | | | | | | |
| 3.25 | 2.878 | 3.192 | 3.035 | 7.716 | 8.568 | 8.142 |
| 6.50 | 2.974 | 3.286 | 3.130 | 7.988 | 8.994 | 8.491 |
| 9.75 | 3.088 | 3.496 | 3.292 | 8.424 | 9.536 | 8.980 |
| 13.00 | 3.140 | 3.634 | 3.387 | 8.522 | 9.702 | 9.112 |
| Mean | 3.087 | 3.403 | - | 8.382 | 9.285 | - |
| Sig.Bio.fert | ** | | | ** | | |
| L.S.D. at 5% : | | | | | | |
| P.fert | 0.012 | | | 0.010 | | |
| Bio. fert. xP.fert | 0.017 | | | 0.014 | | |

Table (4): N,P and K concentration in wheat grains (%) as affected by P-biofertilizer and application of chemical P-fertilizers.

| Treatments | N | | | P | | | K | | |
|------------------------------------|---------------|-------------|-------|---------------|-------------|-------|---------------|-------------|-------|
| | Uninoculation | Inoculation | Mean | Uninoculation | Inoculation | Mean | Uninoculation | Inoculation | Mean |
| Control | 1.96 | 2.08 | 2.020 | 0.32 | 0.37 | 0.345 | 0.44 | 0.47 | 0.455 |
| P rates (kg/fad.)as Super-p | | | | | | | | | |
| 3.25 | 1.98 | 2.10 | 2.040 | 0.36 | 0.41 | 0.385 | 0.46 | 0.49 | 0.475 |
| 6.50 | 2.02 | 2.15 | 2.085 | 0.38 | 0.42 | 0.400 | 0.49 | 0.52 | 0.505 |
| 9.75 | 2.06 | 2.19 | 2.125 | 0.39 | 0.43 | 0.410 | 0.51 | 0.54 | 0.525 |
| 13.00 | 2.07 | 2.19 | 2.130 | 0.41 | 0.43 | 0.420 | 0.51 | 0.52 | 0.515 |
| P rates (kg/fad.)as Rock-P | | | | | | | | | |
| 3.25 | 1.98 | 2.03 | 2.005 | 0.33 | 0.35 | 0.340 | 0.45 | 0.47 | 0.460 |
| 6.50 | 2.00 | 2.08 | 2.040 | 0.34 | 0.36 | 0.350 | 0.46 | 0.49 | 0.475 |
| 9.75 | 2.04 | 2.14 | 2.090 | 0.36 | 0.39 | 0.375 | 0.47 | 0.52 | 0.495 |
| 13.00 | 2.04 | 2.19 | 2.115 | 0.38 | 0.42 | 0.400 | 0.49 | 0.54 | 0.515 |
| Mean | 2.017 | 2.128 | - | 0.363 | 0.398 | - | 0.476 | 0.507 | - |
| Sig. Bio. fert | ** | | | ** | | | ** | | |
| L.S.D. at 5% : | | | | | | | | | |
| P.fert | 0.049 | | | 0.028 | | | 0.030 | | |
| Bio.fert.xP.fert | N.S | | | N.S | | | N.S | | |

Table (5): N,P and K concentration in wheat straw (%) as affected by P-biofertilizer and application of chemical P-fertilizers.

| Treatments | N | | | P | | | K | | |
|-------------------------------------|---------------|-------------|-------|---------------|-------------|-------|---------------|-------------|-------|
| | Uninoculation | Inoculation | Mean | Uninoculation | Inoculation | Mean | Uninoculation | Inoculation | Mean |
| Control | 0.46 | 0.50 | 0.480 | 0.042 | 0.045 | 0.044 | 1.66 | 1.76 | 1.710 |
| P rates (kg/fad.)as: Super-p | | | | | | | | | |
| 3.25 | 0.50 | 0.52 | 0.510 | 0.045 | 0.048 | 0.047 | 1.75 | 1.87 | 1.810 |
| 6.50 | 0.53 | 0.55 | 0.540 | 0.047 | 0.050 | 0.049 | 1.80 | 1.93 | 1.865 |
| 9.75 | 0.58 | 0.60 | 0.590 | 0.051 | 0.054 | 0.053 | 1.87 | 2.02 | 1.945 |
| 13.00 | 0.58 | 0.59 | 0.585 | 0.050 | 0.053 | 0.052 | 1.89 | 2.04 | 1.965 |
| P rates (kg/fad.)as Rock-P | | | | | | | | | |
| 3.25 | 0.47 | 0.48 | 0.475 | 0.043 | 0.046 | 0.045 | 1.72 | 1.82 | 1.770 |
| 6.50 | 0.50 | 0.52 | 0.510 | 0.045 | 0.049 | 0.047 | 1.74 | 1.87 | 1.805 |
| 9.75 | 0.53 | 0.57 | 0.550 | 0.045 | 0.050 | 0.048 | 1.75 | 1.94 | 1.845 |
| 13.00 | 0.54 | 0.60 | 0.570 | 0.048 | 0.054 | 0.051 | 1.85 | 2.04 | 1.945 |
| Mean | 0.521 | 0.548 | - | 0.046 | 0.050 | - | 1.781 | 1.921 | - |
| Sig. Bio. fert | ** | | | ** | | | ** | | |
| L.S.D. at 5% : | | | | | | | | | |
| P.fert | 0.033 | | | 0.003 | | | 0.038 | | |
| Bio.fert.xP.fert | N.S | | | N.S | | | N.S | | |

Table (6): N,P and K contents in wheat grains (kg / fad) as affected by P-biofertilizer and application of chemical P-fertilizers.

| Treatments | N | | | P | | | K | | |
|-------------------------------------|---------------|-------------|-------|---------------|-------------|-------|---------------|-------------|-------|
| | Uninoculation | Inoculation | Mean | Uninoculation | Inoculation | Mean | Uninoculation | Inoculation | Mean |
| Control | 54.53 | 64.98 | 59.76 | 8.90 | 11.56 | 10.23 | 12.24 | 14.68 | 13.46 |
| P rates (kg/fad.)as: Super-p | | | | | | | | | |
| 3.25 | 59.04 | 68.42 | 63.73 | 10.74 | 13.36 | 12.05 | 13.72 | 15.96 | 14.84 |
| 6.50 | 64.64 | 73.96 | 69.30 | 12.16 | 14.45 | 13.31 | 15.68 | 17.89 | 16.79 |
| 9.75 | 69.71 | 79.45 | 74.58 | 13.20 | 15.60 | 14.40 | 17.26 | 19.59 | 18.43 |
| 13.00 | 69.43 | 78.23 | 73.83 | 13.75 | 15.36 | 14.56 | 17.11 | 18.57 | 17.84 |
| P rates (kg/fad.)as Rock-P | | | | | | | | | |
| 3.25 | 56.98 | 64.80 | 60.89 | 9.50 | 11.17 | 10.34 | 12.95 | 15.00 | 13.98 |
| 6.50 | 59.48 | 63.35 | 61.42 | 10.11 | 11.83 | 10.97 | 13.68 | 16.10 | 14.89 |
| 9.75 | 63.00 | 74.81 | 68.91 | 11.12 | 13.63 | 12.38 | 14.51 | 18.18 | 16.35 |
| 13.00 | 64.06 | 79.58 | 71.82 | 11.93 | 15.26 | 13.60 | 15.39 | 19.62 | 17.51 |
| Mean | 62.32 | 71.95 | - | 11.27 | 13.58 | - | 14.73 | 17.29 | - |
| Sig. Bio. fert | ** | | | ** | | | ** | | |
| L.S.D. at 5% : | | | | | | | | | |
| P.fert | 1.77 | | | 0.95 | | | 1.02 | | |
| Bio.fert.xP.fert | 2.50 | | | N.S | | | N.S | | |

Table (7): N,P and K contents in wheat straw (kg/fad) as affected by P-biofertilizer and application of chemical P-fertilizers.

| Treatments | N | | | P | | | K | | |
|-------------------------------------|---------------|-------------|-------|---------------|-------------|------|---------------|-------------|--------|
| | Uninoculation | Inoculation | Mean | Uninoculation | Inoculation | Mean | Uninoculation | Inoculation | Mean |
| Control | 33.30 | 43.42 | 38.36 | 3.04 | 3.91 | 3.48 | 120.18 | 152.84 | 136.51 |
| P rates (kg/fad.)as: Super-p | | | | | | | | | |
| 3.25 | 40.91 | 47.66 | 44.29 | 3.68 | 4.40 | 4.04 | 143.19 | 171.40 | 157.30 |
| 6.50 | 46.81 | 52.22 | 49.52 | 4.15 | 4.75 | 4.45 | 158.98 | 183.23 | 171.11 |
| 9.75 | 53.33 | 58.25 | 55.79 | 4.69 | 5.24 | 4.97 | 171.93 | 196.10 | 184.02 |
| 13.00 | 54.17 | 57.31 | 55.74 | 4.67 | 5.15 | 4.91 | 176.53 | 198.17 | 187.35 |
| P rates (kg/fad.)as Rock-P | | | | | | | | | |
| 3.25 | 36.27 | 41.13 | 38.70 | 3.32 | 3.94 | 3.63 | 132.72 | 155.94 | 144.33 |
| 6.50 | 39.94 | 46.77 | 43.36 | 3.59 | 4.41 | 4.00 | 138.99 | 168.19 | 153.59 |
| 9.75 | 44.65 | 54.36 | 49.51 | 3.79 | 4.77 | 4.28 | 147.42 | 185.00 | 166.21 |
| 13.00 | 46.02 | 58.21 | 52.12 | 4.09 | 5.24 | 4.67 | 157.66 | 197.92 | 177.79 |
| Mean | 43.93 | 51.04 | - | 3.89 | 4.65 | - | 149.73 | 178.75 | - |
| Sig. Bio. fert | ** | | | ** | | | ** | | |
| L.S.D. at 5% : | | | | | | | | | |
| P.fert | 2.98 | | | 0.24 | | | 3.45 | | |
| Bio.fert.xP.fert | N.S. | | | N.S. | | | 4.88 | | |

Table (8): Protein percentage and protein yield in grains of wheat as affected by P-biofertilizer and application of chemical P- fertilizers

| Treatments | Protein, % | | | Protein yield, kg/fad | | |
|-------------------------------------|---------------|--------------|--------------|-----------------------|---------------|---------------|
| | Uninoculation | Inoculation | Mean | Uninoculation | Inoculation | Mean |
| Control | 11.17 | 11.86 | 11.52 | 310.75 | 370.51 | 340.63 |
| P rates (kg/fad.)as: Super-p | | | | | | |
| 3.25 | 11.29 | 11.97 | 11.63 | 336.67 | 389.98 | 363.33 |
| 6.50 | 11.51 | 12.26 | 11.89 | 368.32 | 421.74 | 395.03 |
| 9.75 | 11.74 | 12.48 | 12.11 | 397.28 | 452.77 | 425.03 |
| 13.00 | 11.80 | 12.48 | 12.14 | 395.77 | 445.79 | 420.78 |
| P rates (kg/fad.)as Rock-P | | | | | | |
| 3.25 | 11.29 | 11.57 | 11.43 | 324.93 | 369.31 | 347.12 |
| 6.50 | 11.40 | 11.86 | 11.63 | 339.04 | 389.72 | 364.38 |
| 9.75 | 11.63 | 12.20 | 11.92 | 359.13 | 426.51 | 392.82 |
| 13.00 | 11.63 | 12.48 | 12.06 | 365.18 | 453.52 | 409.35 |
| Mean | 11.50 | 12.13 | - | 355.23 | 413.32 | - |
| Sig.Bio.fert. | ** | | | ** | | |
| L.S.D. at 5% : | | | | | | |
| P.fert | 0.28 | | | 10.03 | | |
| Bio. ferti. xP.fert | N.S | | | 14.18 | | |

Table (9): Agronomic P efficiency and available P in soil after harvest as affected by P-biofertilizer and application of chemical P-fertilizers.

| Treatments | Agronomic P efficiency (kg/kg) | | | | Available P in soil (ppm) | | |
|-------------------------------------|--------------------------------|-------------|-------|---------------|---------------------------|-------|---------------|
| | Uninoculation | Inoculation | Mean | Uninoculation | Inoculation | Mean | Uninoculation |
| Control | - | - | - | - | 9.20 | 13.86 | 11.53 |
| P rates (kg/fad.)as: Super-p | | | | | | | |
| 3.25 | 61.54 | 41.23 | 51.39 | 146.46 | 11.34 | 14.30 | 12.82 |
| 6.50 | 64.31 | 48.62 | 56.47 | 101.23 | 12.18 | 14.88 | 13.53 |
| 9.75 | 61.74 | 51.69 | 56.72 | 86.77 | 12.66 | 14.98 | 13.82 |
| 13.00 | 44.00 | 34.46 | 39.23 | 60.77 | 13.52 | 15.12 | 14.32 |
| P rates (kg/fad.)as Rock-P | | | | | | | |
| 3.25 | 29.54 | 20.92 | 25.23 | 126.15 | 10.84 | 13.60 | 12.22 |
| 6.50 | 29.54 | 24.92 | 27.23 | 77.54 | 11.40 | 13.86 | 12.63 |
| 9.75 | 31.38 | 38.15 | 34.77 | 73.23 | 11.94 | 13.98 | 12.96 |
| 13.00 | 27.54 | 39.23 | 33.39 | 65.54 | 12.76 | 14.12 | 13.44 |
| Mean | 43.70 | 37.40 | - | 92.21 | 11.76 | 14.30 | - |
| Sig. Bio. fert | | | | | ** | | |
| L.S.D. at 5% : | | | | | | | |
| P.fert | | | | | 0.10 | | |
| Bio.fert.xP.fert. | | | | | 0.15 | | |