**Supplementary table 1.** Treatment combinations used in the experiment

|  |  |  |  |
| --- | --- | --- | --- |
| **Treatment code** | **Combination** | **Treatment code** | **Combination** |
| T0 | Control (spray with water) | T8 | Pf-7 vegetable oil (2 %) |
| T1 | Pf-6 talc (5 %) | T9 | Pf-7 PVP (2 %) |
| T2 | Pf-6 kaolinite (5 %) | T10 | Pf-7 bacterial suspension (2 %) |
| T3 | Pf-6 vegetable oil (2 %) | T11 | Pf-8 talc (5 %) |
| T4 | Pf-6 PVP (2 %) | T12 | Pf-8 kaolinite (5 %) |
| T5 | Pf-6 bacterial suspension (2 %) | T13 | Pf-8 vegetable oil (2 %) |
| T6 | Pf-7 talc (5 %) | T14 | Pf-8 PVP (2 %) |
| T7 | Pf-7 kaolinite (5 %) | T15 | Pf-8 bacterial suspension (2 %) |

**Supplementary table 2.** Formulations and their composition used in the experiment

|  |  |
| --- | --- |
| **Formulation** | **Materials used** |
| Mineral clay-based | : 300 mL bacterial suspension (109 CFU mL-1), 1kg talc/kaolinite, 10g carboxy methyl cellulose (CMC), 15g CaCO3, and 30 mL 50% glycerol |
| Oil-based | : 300 mL bacterial suspension (109 CFU mL-1), 6 mL vegetable oil (groundnut), 0.15 mL Triton X-100, and 30 mL 50% glycerol |
| Polymer-based | : 300 mL bacterial suspension (109 CFU mL-1) and 2 % PVP |
| Bacterial suspension-based | : 300 mL bacterial suspension (109 CFU mL-1) |

**Supplementary table 3. Preliminary evaluation of different concentrations of *P. fluorescens* formulations**

Level of significance=0.05

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Carriers or  additives | Bacteria | Concentration | % Germination | Carriers or additives | Bacteria | Concentration | % Germination |
| Talc | Pf-6 | 1% | 46.33 c | Vegetable oil | Pf-6 | 0.5% | 60 .00 c |
| 3% | 72.00 b | 1% | 78.33 b |
| 5% | 98.33 a | 2% | 96.66 a |
| Control | 34.00 d | Control | 34.00 d |
| CV (%) | 3.35 | CV (%) | 4.97 |
| Pf-7 | 1% | 51.66 c | Pf-7 | 0.5% | 68.00 c |
| 3% | 76.33 b | 1% | 82.33 b |
| 5% | 100.00 a | 2% | 100.00 a |
| Control | 34.00 d | Control | 34.00 d |
| CV (%) | 2.36 | CV (%) | 2.95 |
| Pf-8 | 1% | 51.67 c | Pf-8 | 0.5% | 72.00 c |
| 3% | 78.33 b | 1% | 92.33 b |
| 5% | 100.00 a | 2% | 100.00 a |
| Control | 34.00 d | Control | 34.00 d |
| CV (%) | 3.36 | CV (%) | 2.71 |
| Kaolinite | Pf-6 | 1% | 44.33 c | Polyvinyl  pyrrolidone | Pf-6 | 0.5% | 42.00 c |
| 3% | 70.00 b | 1% | 60.00 b |
| 5% | 90.66 a | 2% | 84.00 a |
| Control | 34.00 d | Control | 34.00 d |
| CV (%) | 2.73 | CV (%) | 3.02 |
| Pf-7 | 1% | 49.66 c | Pf-7 | 0.5% | 48.00 c |
| 3% | 74.33 b | 1% | 68.00 b |
| 5% | 90.00 a | 2% | 80.00 a |
| Control | 34.00 d | Control | 34.00 d |
| CV (%) | 2.51 | CV (%) | 3.40 |
| Pf-8 | 1% | 52.33 c | Pf-8 | 0.5% | 54.33 c |
| 3% | 72.33 b | 1% | 70.33 b |
| 5% | 91.67 a | 2% | 88.33 a |
| Control | 34.00 d | Control | 34.00 d |
| CV (%) | 3.91 | CV (%) | 4.08 |

**Supplementary table 4.** Assessing the shelf-life of formulated  *P. fluorescens*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Days after storage** | **Name**  **of bacteria** | **Colony Forming Units (CFUs)** | | | | |
| **Talc** | **Kaolinite** | **Vegetable oil** | **PVP** | **Bacterial suspension** |
| 30 DAS | Pf-6 | 8.20 × 108 | 7.10 × 107 | 7.50 × 107 | 6.60 × 107 | 6.50 × 105 |
| Pf-7 | 8.10 × 108 | 7.75 × 108 | 7.00 × 107 | 6.40 × 107 | 6.25 × 105 |
| Pf-8 | 8.51 × 108 | 7.85 × 109 | 8.02 × 109 | 7.80 × 109 | 6.60 × 106 |
| 60 DAS | Pf-6 | 7.95× 108 | 7.30 × 108 | 7.08 × 108 | 6.25 ×108 | 5.25 × 105 |
| Pf-7 | 7.80× 1010 | 7.50 × 109 | 7.00 × 108 | 6.20 × 108 | 5.13 × 106 |
| Pf-8 | 8.00 ×1010 | 7.55 × 1010 | 8.05 × 1010 | 7.50 × 1010 | 5.57 × 108 |
| 90 DAS | Pf-6 | 7.30 × 1010 | 7.02 × 1010 | 6.20 × 108 | 5.30 × 108 | 5.22 ×106 |
| Pf-7 | 7.25 × 1010 | 7.00 × 1010 | 6.45 × 108 | 5.45 × 108 | 5.15 × 105 |
| Pf-8 | 9.60 × 1010 | 8.05 × 1010 | 9.51 × 1010 | 5.00 × 1010 | 5.60 × 107 |
| 120 DAS | Pf-6 | 7.50 × 108 | 6.30 × 108 | 5.43 × 107 | 4.36 × 107 | 4.50 × 105 |
| Pf-7 | 6.45 × 109 | 6.40 × 109 | 5.25 × 107 | 4.32 × 107 | 4.55 × 104 |
| Pf-8 | 7.80 × 109 | 7.48 × 109 | 7.60 × 1010 | 6.00 × 109 | 4.80 × 106 |
| 180 DAS | Pf-6 | 5.55 × 108 | 5.25 × 107 | 4.53 × 106 | 3.56 × 106 | 4.03 × 103 |
| Pf-7 | 5.50 × 108 | 5.27 × 107 | 4.50 × 105 | 3.20 × 106 | 4.00 × 102 |
| Pf-8 | 6.75 × 108 | 6.50 × 108 | 6.70 × 108 | 6.40 × 107 | 4.13 × 105 |
| 240 DAS | Pf-6 | 5.00 × 107 | 4.50 × 106 | 3.65 × 104 | 3.33 × 106 | 3.50 × 102 |
| Pf-7 | 5.10 × 107 | 4.41 × 106 | 3.50 × 103 | 3.60 × 104 | 3.33 × 101 |
| Pf-8 | 5.20 × 107 | 5.00 × 107 | 6.10 × 107 | 5.00 × 106 | 3.60 × 104 |
| 300 DAS | Pf-6 | 2.20 × 106 | 2.42 × 105 | 1.00 × 103 | 1.00 × 105 | 3.00 × 101 |
| Pf-7 | 3.02 × 106 | 2.33 × 105 | 1.20 × 102 | 1.30 × 103 | 3.33 × 101 |
| Pf-8 | 3.12 × 106 | 2.92 × 106 | 4.02 × 106 | 2.21 × 105 | 3.25 × 103 |

|  |  |  |
| --- | --- | --- |
| **(b)** | **(c)** |  |
| **(e)**  **(d)** | | |
| **(g)**  **(f)** | **(h)** |  |
| **(j)**  **(i)** | | |

**(a)**

**Supplementary figure 1.**  Correlation between different vegetative parameters, biochemical constituents, and disease incidence (%) (a-e), and severity (%) (f-j) at 30 DAT

|  |  |  |
| --- | --- | --- |
| **(b)** | **(c)** |  |
| **(e)** | **(f)** |  |
| **(h)** | **(i)** |  |
| **(k)** | **(l)** |  |

**(j)**

**(g)**

**(d)**

**(a)**

**Supplementary figure 2.** Correlation between different vegetative parameters, biochemical constituents, and disease incidence (%) (a-f), and severity (%) (g-l) at 60 DAT

|  |  |  |
| --- | --- | --- |
| **(b)**  **(a)** | **(c)** |  |
| **(e)**  **(d)** | **(f)** |  |
| **(h)**  **(g)** | **(i)** |  |
| **(m)**  **(k)**  **(j)** | **(l)** |  |
| **(n)** | **(o)** |  |
| **Supplementary figure 3.** Correlation between different vegetative parameters, yield parameters, and biochemical constituents with disease incidence (%) (a-i), and severity (%) (j-r) at 90 DAT  **(q)**  **(p)** | **(r)** |  |

Development of formulation using talc, kaolinite, vegetable oil, PVP, and bacterial suspension

Selection of antagonist bacteria

Assessment of shelf value of bacteria in different formulations

Application of formulated *Pseudomonas fluorescens*

Root dipping and Foliar application

Indirect mechanism

Direct mechanism

Production of hydrogen cyanide, antibiotics, antifungal compounds, siderophores, activation of pathogenesis-related proteins like PR1, PR2, PR3, PR4

Production of phytohormones, ACC deaminase, nitrogen fixation, and phosphate solubilization

Growth promotion of rice

Suppression of blast disease incidence and severity

Yield increment

**Supplementary figure 4.** Schematic representation of the mechanism of *P. fluorescens*-mediated growth, yield promotion, and disease tolerance in rice