Experiment 1 – Inoc only Oct 24 Hill

**Fit Group**

**Response % crust cover Oct 24**

**Whole Model**

**Actual by Predicted Plot**



**Summary of Fit**

|  |  |
| --- | --- |
| RSquare | 0.886275 |
| RSquare Adj | 0.862151 |
| Root Mean Square Error | 1.709451 |
| Mean of Response | 6.414634 |
| Observations (or Sum Wgts) | 41 |

**Analysis of Variance**

| **Source** | **DF** | **Sum of Squares** | **Mean Square** | **F Ratio** |
| --- | --- | --- | --- | --- |
| Model | 7 | 751.51789 | 107.360 | 36.7391 |
| Error | 33 | 96.43333 | 2.922 | **Prob > F** |
| C. Total | 40 | 847.95122 |  | <.0001\* |

**Parameter Estimates**

| **Term** |  | **Estimate** | **Std Error** | **t Ratio** | **Prob>|t|** |
| --- | --- | --- | --- | --- | --- |
| Intercept |  | 6.5208333 | 0.267458 | 24.38 | <.0001\* |
| SOIL TYPE[1] |  | 0.9208333 | 0.267458 | 3.44 | 0.0016\* |
| INOC[C] |  | -5.2375 | 0.453287 | -11.55 | <.0001\* |
| INOC[H] |  | 5.8791667 | 0.466524 | 12.60 | <.0001\* |
| INOC[L] |  | -1.520833 | 0.466524 | -3.26 | 0.0026\* |
| SOIL TYPE[1]\*INOC[C] |  | -0.0375 | 0.453287 | -0.08 | 0.9346 |
| SOIL TYPE[1]\*INOC[H] |  | 0.4791667 | 0.466524 | 1.03 | 0.3118 |
| SOIL TYPE[1]\*INOC[L] |  | 1.2791667 | 0.466524 | 2.74 | 0.0098\* |

**Effect Tests**

| **Source** | **Nparm** | **DF** | **Sum of Squares** | **F Ratio** | **Prob > F** |  |
| --- | --- | --- | --- | --- | --- | --- |
| SOIL TYPE | 1 | 1 | 34.63901 | 11.8537 | 0.0016\* |  |
| INOC | 3 | 3 | 675.20222 | 77.0193 | <.0001\* |  |
| SOIL TYPE\*INOC | 3 | 3 | 48.28667 | 5.5080 | 0.0035\* |  |

**Residual by Predicted Plot**



**SOIL TYPE**

**Leverage Plot**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| 1 | 7.4416667 |  | 0.37419667 | 7.19048 |
| 2 | 5.6000000 |  | 0.38224483 | 5.60000 |

**INOC**

**Leverage Plot**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| C | 1.283333 |  | 0.51756195 | 1.3636 |
| H | 12.400000 |  | 0.54057582 | 12.4000 |
| L | 5.000000 |  | 0.54057582 | 5.0000 |
| M | 7.400000 |  | 0.54057582 | 7.4000 |

**SOIL TYPE\*INOC**

**Leverage Plot**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| 1,C | 2.166667 |  | 0.69788039 |
| 1,H | 13.800000 |  | 0.76448966 |
| 1,L | 7.200000 |  | 0.76448966 |
| 1,M | 6.600000 |  | 0.76448966 |
| 2,C | 0.400000 |  | 0.76448966 |
| 2,H | 11.000000 |  | 0.76448966 |
| 2,L | 2.800000 |  | 0.76448966 |
| 2,M | 8.200000 |  | 0.76448966 |

**LSMeans Differences Tukey HSD**

α=

0.050 Q=

3.23278

LSMean[i] By LSMean[j]

| **Level** |  |  |  |  |  |  | **Least Sq Mean** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1,H | A |  |  |  |  |  | 13.800000 |
| 2,H | A | B |  |  |  |  | 11.000000 |
| 2,M |  | B | C |  |  |  | 8.200000 |
| 1,L |  |  | C |  |  |  | 7.200000 |
| 1,M |  |  | C |  |  |  | 6.600000 |
| 2,L |  |  |  | D |  |  | 2.800000 |
| 1,C |  |  |  | D |  |  | 2.166667 |
| 2,C |  |  |  | D |  |  | 0.400000 |

Levels not connected by same letter are significantly different.

**Response % plant cover Oct 24 2013**

**Whole Model**

**Actual by Predicted Plot**

**Summary of Fit**

|  |  |
| --- | --- |
| RSquare | 0.604413 |
| RSquare Adj | 0.5205 |
| Root Mean Square Error | 1.982754 |
| Mean of Response | 2.585366 |
| Observations (or Sum Wgts) | 41 |

**Analysis of Variance**

| **Source** | **DF** | **Sum of Squares** | **Mean Square** | **F Ratio** |
| --- | --- | --- | --- | --- |
| Model | 7 | 198.21789 | 28.3168 | 7.2029 |
| Error | 33 | 129.73333 | 3.9313 | **Prob > F** |
| C. Total | 40 | 327.95122 |  | <.0001\* |

**Parameter Estimates**

| **Term** |  | **Estimate** | **Std Error** | **t Ratio** | **Prob>|t|** |
| --- | --- | --- | --- | --- | --- |
| Intercept |  | 2.6333333 | 0.310218 | 8.49 | <.0001\* |
| SOIL TYPE[1] |  | -2.116667 | 0.310218 | -6.82 | <.0001\* |
| INOC[C] |  | -0.6 | 0.525757 | -1.14 | 0.2620 |
| INOC[H] |  | 0.2666667 | 0.541111 | 0.49 | 0.6254 |
| INOC[L] |  | -0.133333 | 0.541111 | -0.25 | 0.8069 |
| SOIL TYPE[1]\*INOC[C] |  | 0.75 | 0.525757 | 1.43 | 0.1631 |
| SOIL TYPE[1]\*INOC[H] |  | -0.383333 | 0.541111 | -0.71 | 0.4837 |
| SOIL TYPE[1]\*INOC[L] |  | 0.0166667 | 0.541111 | 0.03 | 0.9756 |

**Effect Tests**

| **Source** | **Nparm** | **DF** | **Sum of Squares** | **F Ratio** | **Prob > F** |  |
| --- | --- | --- | --- | --- | --- | --- |
| SOIL TYPE | 1 | 1 | 183.02411 | 46.5555 | <.0001\* |  |
| INOC | 3 | 3 | 6.98667 | 0.5924 | 0.6244 |  |
| SOIL TYPE\*INOC | 3 | 3 | 9.06667 | 0.7688 | 0.5198 |  |

**Residual by Predicted Plot**



**SOIL TYPE**

**Leverage Plot**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| 1 | 0.5166667 |  | 0.43402237 | 0.52381 |
| 2 | 4.7500000 |  | 0.44335726 | 4.75000 |

**INOC**

**Leverage Plot**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| C | 2.0333333 |  | 0.60030856 | 1.90909 |
| H | 2.9000000 |  | 0.62700184 | 2.90000 |
| L | 2.5000000 |  | 0.62700184 | 2.50000 |
| M | 3.1000000 |  | 0.62700184 | 3.10000 |

**SOIL TYPE\*INOC**

**Leverage Plot**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| 1,C | 0.6666667 |  | 0.80945590 |
| 1,H | 0.4000000 |  | 0.88671451 |
| 1,L | 0.4000000 |  | 0.88671451 |
| 1,M | 0.6000000 |  | 0.88671451 |
| 2,C | 3.4000000 |  | 0.88671451 |
| 2,H | 5.4000000 |  | 0.88671451 |
| 2,L | 4.6000000 |  | 0.88671451 |
| 2,M | 5.6000000 |  | 0.88671451 |

Exp 2 – condions – roughening, shade, water, inoc level

**Least Squares Fit**

**Response % crust cover Oct 24**

**Actual by Predicted Plot**



**Parameter Estimates**

**Effect Tests**

| **Source** | **Nparm** | **DF** | **Sum of Squares** | **F Ratio** | **Prob > F** |  |
| --- | --- | --- | --- | --- | --- | --- |
| SOIL TYPE | 1 | 1 | 27.5019 | 3.8653 | 0.0513 |  |
| INOC | 1 | 1 | 1781.4735 | 250.3822 | <.0001\* |  |
| WATER | 1 | 1 | 2.4102 | 0.3387 | 0.5615 |  |
| SHADE | 1 | 1 | 0.0160 | 0.0022 | 0.9622 |  |
| ROUGHENING | 1 | 1 | 0.00074366 | 0.0001 | 0.9919 |  |
| SOIL TYPE\*INOC | 1 | 1 | 0.8397 | 0.1180 | 0.7317 |  |
| SOIL TYPE\*WATER | 1 | 1 | 45.7743 | 6.4335 | 0.0123\* |  |
| SOIL TYPE\*SHADE | 1 | 1 | 3.4749 | 0.4884 | 0.4858 |  |
| SOIL TYPE\*ROUGHENING | 1 | 1 | 1.9447 | 0.2733 | 0.6020 |  |
| INOC\*WATER | 1 | 1 | 7.0666 | 0.9932 | 0.3207 |  |
| INOC\*SHADE | 1 | 1 | 0.3605 | 0.0507 | 0.8222 |  |
| INOC\*ROUGHENING | 1 | 1 | 0.5816 | 0.0817 | 0.7754 |  |
| INOC\*WATER\*SOIL TYPE | 1 | 1 | 25.2802 | 3.5531 | 0.0616 |  |
| INOC\*SHADE\*SOIL TYPE | 1 | 1 | 0.0160 | 0.0022 | 0.9622 |  |
| INOC\*ROUGHENING\*SOIL TYPE | 1 | 1 | 0.00074366 | 0.0001 | 0.9919 |  |
| INOC\*WATER\*SHADE | 1 | 1 | 67.0343 | 9.4215 | 0.0026\* |  |
| INOC\*WATER\*ROUGHENING | 1 | 1 | 54.6535 | 7.6814 | 0.0064\* |  |
| INOC\*SHADE\*ROUGHENING | 1 | 1 | 17.0952 | 2.4027 | 0.1234 |  |
| INOC\*WATER\*SHADE\*SOIL TYPE | 1 | 1 | 50.9248 | 7.1574 | 0.0084\* |  |
| INOC\*WATER\*ROUGHENING\*SOIL TYPE | 1 | 1 | 6.2298 | 0.8756 | 0.3511 |  |
| INOC\*SHADE\*ROUGHENING\*SOIL TYPE | 1 | 1 | 0.0171 | 0.0024 | 0.9610 |  |
| INOC\*SHADE\*ROUGHENING\*SOIL TYPE\*WATER | 1 | 1 | 15.3477 | 2.1571 | 0.1442 |  |

**Sorted Parameter Estimates**

**Effect Details**

**SOIL TYPE**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| 1 | 5.8674777 |  | 0.29879467 | 5.83750 |
| 2 | 5.0375000 |  | 0.29822426 | 5.03750 |

**INOC**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| C | 2.1125000 |  | 0.29822426 | 2.11250 |
| H | 8.7924777 |  | 0.29879467 | 8.76250 |

**WATER**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| NW | 5.5753310 |  | 0.30039311 | 5.53165 |
| W | 5.3296466 |  | 0.29659021 | 5.34568 |

**SHADE**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| NS | 5.4424777 |  | 0.29879467 | 5.41250 |
| S | 5.4625000 |  | 0.29822426 | 5.46250 |

**ROUGHENING**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| NR | 5.4546466 |  | 0.29659021 | 5.46914 |
| R | 5.4503310 |  | 0.30039311 | 5.40506 |

**SOIL TYPE\*INOC**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| 1,C | 2.6000000 |  | 0.42175280 |
| 1,H | 9.1349553 |  | 0.42336460 |
| 2,C | 1.6250000 |  | 0.42175280 |
| 2,H | 8.4500000 |  | 0.42175280 |

**SOIL TYPE\*WATER**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| 1,NW | 6.5256621 |  | 0.42786524 |
| 1,W | 5.2092932 |  | 0.41711820 |
| 2,NW | 4.6250000 |  | 0.42175280 |
| 2,W | 5.4500000 |  | 0.42175280 |

**LSMeans Differences Tukey HSD**

α=

0.050 Q=

2.60085

LSMean[i] By LSMean[j]

| **Level** |  |  |  |  |  |  | **Least Sq Mean** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1,NW | A |  |  |  |  |  | 6.5256621 |
| 2,W | A | B |  |  |  |  | 5.4500000 |
| 1,W | A | B |  |  |  |  | 5.2092932 |
| 2,NW |  | B |  |  |  |  | 4.6250000 |

Levels not connected by same letter are significantly different.

**SOIL TYPE\*SHADE**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| 1,NS | 5.7099553 |  | 0.42336460 |
| 1,S | 6.0250000 |  | 0.42175280 |
| 2,NS | 5.1750000 |  | 0.42175280 |
| 2,S | 4.9000000 |  | 0.42175280 |

**SOIL TYPE\*ROUGHENING**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| 1,NR | 5.7592932 |  | 0.41711820 |
| 1,R | 5.9756621 |  | 0.42786524 |
| 2,NR | 5.1500000 |  | 0.42175280 |
| 2,R | 4.9250000 |  | 0.42175280 |

**INOC\*WATER**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| C,NW | 2.0250000 |  | 0.42175280 |
| C,W | 2.2000000 |  | 0.42175280 |
| H,NW | 9.1256621 |  | 0.42786524 |
| H,W | 8.4592932 |  | 0.41711820 |

**INOC\*SHADE**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| C,NS | 2.1500000 |  | 0.42175280 |
| C,S | 2.0750000 |  | 0.42175280 |
| H,NS | 8.7349553 |  | 0.42336460 |
| H,S | 8.8500000 |  | 0.42175280 |

**INOC\*ROUGHENING**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| C,NR | 2.1750000 |  | 0.42175280 |
| C,R | 2.0500000 |  | 0.42175280 |
| H,NR | 8.7342932 |  | 0.41711820 |
| H,R | 8.8506621 |  | 0.42786524 |

**INOC\*WATER\*SOIL TYPE**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| C,NW,1 | 2.650000 |  | 0.59644853 |
| C,NW,2 | 1.400000 |  | 0.59644853 |
| C,W,1 | 2.550000 |  | 0.59644853 |
| C,W,2 | 1.850000 |  | 0.59644853 |
| H,NW,1 | 10.401324 |  | 0.61361534 |
| H,NW,2 | 7.850000 |  | 0.59644853 |
| H,W,1 | 7.868586 |  | 0.58326625 |
| H,W,2 | 9.050000 |  | 0.59644853 |

**INOC\*SHADE\*SOIL TYPE**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| C,NS,1 | 2.5000000 |  | 0.59644853 |
| C,NS,2 | 1.8000000 |  | 0.59644853 |
| C,S,1 | 2.7000000 |  | 0.59644853 |
| C,S,2 | 1.4500000 |  | 0.59644853 |
| H,NS,1 | 8.9199107 |  | 0.60099874 |
| H,NS,2 | 8.5500000 |  | 0.59644853 |
| H,S,1 | 9.3500000 |  | 0.59644853 |
| H,S,2 | 8.3500000 |  | 0.59644853 |

**INOC\*ROUGHENING\*SOIL TYPE**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| C,NR,1 | 2.5500000 |  | 0.59644853 |
| C,NR,2 | 1.8000000 |  | 0.59644853 |
| C,R,1 | 2.6500000 |  | 0.59644853 |
| C,R,2 | 1.4500000 |  | 0.59644853 |
| H,NR,1 | 8.9685865 |  | 0.58326625 |
| H,NR,2 | 8.5000000 |  | 0.59644853 |
| H,R,1 | 9.3013242 |  | 0.61361534 |
| H,R,2 | 8.4000000 |  | 0.59644853 |

**INOC\*WATER\*SHADE**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| C,NW,NS | 1.4146578 |  | 0.55799644 |
| C,NW,S | 2.6353422 |  | 0.55799644 |
| C,W,NS | 2.8853422 |  | 0.55799644 |
| C,W,S | 1.5146578 |  | 0.55799644 |
| H,NW,NS | 9.7159820 |  | 0.57181126 |
| H,NW,S | 8.5353422 |  | 0.55799644 |
| H,W,NS | 7.7539287 |  | 0.54747138 |
| H,W,S | 9.1646578 |  | 0.55799644 |

**LSMeans Differences Tukey HSD**

α=

0.050 Q=

3.07834

LSMean[i] By LSMean[j]

| **Level** |  |  |  |  |  |  | **Least Sq Mean** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| H,NW,NS | A |  |  |  |  |  | 9.7159820 |
| H,W,S | A |  |  |  |  |  | 9.1646578 |
| H,NW,S | A |  |  |  |  |  | 8.5353422 |
| H,W,NS | A |  |  |  |  |  | 7.7539287 |
| C,W,NS |  | B |  |  |  |  | 2.8853422 |
| C,NW,S |  | B |  |  |  |  | 2.6353422 |
| C,W,S |  | B |  |  |  |  | 1.5146578 |
| C,NW,NS |  | B |  |  |  |  | 1.4146578 |

Levels not connected by same letter are significantly different.

**INOC\*WATER\*ROUGHENING**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| C,NW,NR | 1.5024888 |  | 0.55800280 |
| C,NW,R | 2.5475112 |  | 0.55800280 |
| C,W,NR | 2.8475112 |  | 0.55800280 |
| C,W,R | 1.5524888 |  | 0.55800280 |
| H,NW,NR | 9.6524888 |  | 0.55800280 |
| H,NW,R | 8.5988354 |  | 0.57176783 |
| H,W,NR | 7.8160976 |  | 0.54742602 |
| H,W,R | 9.1024888 |  | 0.55800280 |

**INOC\*SHADE\*ROUGHENING**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| C,NS,NR | 1.8853422 |  | 0.55799644 |
| C,NS,R | 2.4146578 |  | 0.55799644 |
| C,S,NR | 2.4646578 |  | 0.55799644 |
| C,S,R | 1.6853422 |  | 0.55799644 |
| H,NS,NR | 9.0039287 |  | 0.54747138 |
| H,NS,R | 8.4659820 |  | 0.57181126 |
| H,S,NR | 8.4646578 |  | 0.55799644 |
| H,S,R | 9.2353422 |  | 0.55799644 |

**INOC\*WATER\*SHADE\*SOIL TYPE**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| C,NW,NS,1 | 2.466816 |  | 0.78922503 |
| C,NW,NS,2 | 0.362500 |  | 0.78902724 |
| C,NW,S,1 | 2.833184 |  | 0.78922503 |
| C,NW,S,2 | 2.437500 |  | 0.78902724 |
| C,W,NS,1 | 2.533184 |  | 0.78922503 |
| C,W,NS,2 | 3.237500 |  | 0.78902724 |
| C,W,S,1 | 2.566816 |  | 0.78922503 |
| C,W,S,2 | 0.462500 |  | 0.78902724 |
| H,NW,NS,1 | 10.269464 |  | 0.82783361 |
| H,NW,NS,2 | 9.162500 |  | 0.78902724 |
| H,NW,S,1 | 10.533184 |  | 0.78922503 |
| H,NW,S,2 | 6.537500 |  | 0.78902724 |
| H,W,NS,1 | 7.570357 |  | 0.75916775 |
| H,W,NS,2 | 7.937500 |  | 0.78902724 |
| H,W,S,1 | 8.166816 |  | 0.78922503 |
| H,W,S,2 | 10.162500 |  | 0.78902724 |

**LSMeans Differences Tukey HSD**

α=

0.050 Q=

3.49085

LSMean[i] By LSMean[j]

| **Level** |  |  |  |  |  |  | **Least Sq Mean** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| H,NW,S,1 | A |  |  |  |  |  | 10.533184 |
| H,NW,NS,1 | A | B |  |  |  |  | 10.269464 |
| H,W,S,2 | A |  |  |  |  |  | 10.162500 |
| H,NW,NS,2 | A | B |  |  |  |  | 9.162500 |
| H,W,S,1 | A | B |  |  |  |  | 8.166816 |
| H,W,NS,2 | A | B |  |  |  |  | 7.937500 |
| H,W,NS,1 | A | B |  |  |  |  | 7.570357 |
| H,NW,S,2 |  | B | C |  |  |  | 6.537500 |
| C,W,NS,2 |  |  | C | D |  |  | 3.237500 |
| C,NW,S,1 |  |  | C | D |  |  | 2.833184 |
| C,W,S,1 |  |  |  | D |  |  | 2.566816 |
| C,W,NS,1 |  |  |  | D |  |  | 2.533184 |
| C,NW,NS,1 |  |  |  | D |  |  | 2.466816 |
| C,NW,S,2 |  |  | C | D |  |  | 2.437500 |
| C,W,S,2 |  |  |  | D |  |  | 0.462500 |
| C,NW,NS,2 |  |  |  | D |  |  | 0.362500 |

Levels not connected by same letter are significantly different.

**INOC\*WATER\*ROUGHENING\*SOIL TYPE**

**INOC\*SHADE\*ROUGHENING\*SOIL TYPE**

**INOC\*SHADE\*ROUGHENING\*SOIL TYPE\*WATER**

**Response % plant cover Oct 24 2013**

**Actual by Predicted Plot**



**Analysis of Variance**

| **Source** | **DF** | **Sum of Squares** | **Mean Square** | **F Ratio** |
| --- | --- | --- | --- | --- |
| Model | 22 | 5357.9726 | 243.544 | 13.8531 |
| Error | 137 | 2408.5211 | 17.580 | **Prob > F** |
| C. Total | 159 | 7766.4938 |  | <.0001\* |

**Parameter Estimates**

**Effect Tests**

| **Source** | **Nparm** | **DF** | **Sum of Squares** | **F Ratio** | **Prob > F** |  |
| --- | --- | --- | --- | --- | --- | --- |
| SOIL TYPE | 1 | 1 | 2586.8701 | 147.1447 | <.0001\* |  |
| INOC | 1 | 1 | 59.8682 | 3.4054 | 0.0671 |  |
| WATER | 1 | 1 | 9.1185 | 0.5187 | 0.4726 |  |
| SHADE | 1 | 1 | 1240.6577 | 70.5703 | <.0001\* |  |
| ROUGHENING | 1 | 1 | 14.2375 | 0.8098 | 0.3697 |  |
| SOIL TYPE\*INOC | 1 | 1 | 81.1188 | 4.6141 | 0.0335\* |  |
| SOIL TYPE\*WATER | 1 | 1 | 10.8856 | 0.6192 | 0.4327 |  |
| SOIL TYPE\*SHADE | 1 | 1 | 799.6483 | 45.4851 | <.0001\* |  |
| SOIL TYPE\*ROUGHENING | 1 | 1 | 0.1116 | 0.0063 | 0.9366 |  |
| INOC\*WATER | 1 | 1 | 137.0848 | 7.7976 | 0.0060\* |  |
| INOC\*SHADE | 1 | 1 | 78.2984 | 4.4537 | 0.0366\* |  |
| INOC\*ROUGHENING | 1 | 1 | 7.1152 | 0.4047 | 0.5257 |  |
| INOC\*WATER\*SOIL TYPE | 1 | 1 | 121.8844 | 6.9330 | 0.0094\* |  |
| INOC\*SHADE\*SOIL TYPE | 1 | 1 | 72.7143 | 4.1361 | 0.0439\* |  |
| INOC\*ROUGHENING\*SOIL TYPE | 1 | 1 | 11.1264 | 0.6329 | 0.4277 |  |
| INOC\*WATER\*SHADE | 1 | 1 | 75.1775 | 4.2762 | 0.0405\* |  |
| INOC\*WATER\*ROUGHENING | 1 | 1 | 3.5828 | 0.2038 | 0.6524 |  |
| INOC\*SHADE\*ROUGHENING | 1 | 1 | 2.5533 | 0.1452 | 0.7037 |  |
| INOC\*WATER\*SHADE\*SOIL TYPE | 1 | 1 | 34.3775 | 1.9554 | 0.1643 |  |
| INOC\*WATER\*ROUGHENING\*SOIL TYPE | 1 | 1 | 3.6034 | 0.2050 | 0.6515 |  |
| INOC\*SHADE\*ROUGHENING\*SOIL TYPE | 1 | 1 | 6.2974 | 0.3582 | 0.5505 |  |
| INOC\*SHADE\*ROUGHENING\*SOIL TYPE\*WATER | 1 | 1 | 0.0258 | 0.0015 | 0.9695 |  |

**Sorted Parameter Estimates**

**Effect Details**

**SOIL TYPE**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| 1 | 1.0254308 |  | 0.46967756 | 1.03750 |
| 2 | 9.0750000 |  | 0.46878095 | 9.07500 |

**INOC**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| C | 5.6625000 |  | 0.46878095 | 5.66250 |
| H | 4.4379308 |  | 0.46967756 | 4.45000 |

**WATER**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| NW | 5.2891512 |  | 0.47219017 | 5.35443 |
| W | 4.8112795 |  | 0.46621237 | 4.76543 |

**SHADE**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| NS | 2.2629308 |  | 0.46967756 | 2.27500 |
| S | 7.8375000 |  | 0.46878095 | 7.83750 |

**ROUGHENING**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| NR | 5.3487795 |  | 0.46621237 | 5.29630 |
| R | 4.7516512 |  | 0.47219017 | 4.81013 |

**SOIL TYPE\*INOC**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| 1,C | 0.925000 |  | 0.66295637 |
| 1,H | 1.125862 |  | 0.66548997 |
| 2,C | 10.400000 |  | 0.66295637 |
| 2,H | 7.750000 |  | 0.66295637 |

**LSMeans Differences Tukey HSD**

α=

0.050 Q=

2.60085

LSMean[i] By LSMean[j]

| **Level** |  |  |  |  |  |  | **Least Sq Mean** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 2,C | A |  |  |  |  |  | 10.400000 |
| 2,H |  | B |  |  |  |  | 7.750000 |
| 1,H |  |  | C |  |  |  | 1.125862 |
| 1,C |  |  | C |  |  |  | 0.925000 |

Levels not connected by same letter are significantly different.

**SOIL TYPE\*WATER**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| 1,NW | 1.0033025 |  | 0.67256456 |
| 1,W | 1.0475590 |  | 0.65567121 |
| 2,NW | 9.5750000 |  | 0.66295637 |
| 2,W | 8.5750000 |  | 0.66295637 |

**SOIL TYPE\*SHADE**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| 1,NS | 0.475862 |  | 0.66548997 |
| 1,S | 1.575000 |  | 0.66295637 |
| 2,NS | 4.050000 |  | 0.66295637 |
| 2,S | 14.100000 |  | 0.66295637 |

**LSMeans Differences Tukey HSD**

α=

0.050 Q=

2.60085

| **Level** |  |  |  |  |  |  | **Least Sq Mean** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 2,S | A |  |  |  |  |  | 14.100000 |
| 2,NS |  | B |  |  |  |  | 4.050000 |
| 1,S |  |  | C |  |  |  | 1.575000 |
| 1,NS |  |  | C |  |  |  | 0.475862 |

Levels not connected by same letter are significantly different.

**SOIL TYPE\*ROUGHENING**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| 1,NR | 1.2975590 |  | 0.65567121 |
| 1,R | 0.7533025 |  | 0.67256456 |
| 2,NR | 9.4000000 |  | 0.66295637 |
| 2,R | 8.7500000 |  | 0.66295637 |

**INOC\*WATER**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| C,NW | 4.9750000 |  | 0.66295637 |
| C,W | 6.3500000 |  | 0.66295637 |
| H,NW | 5.6033025 |  | 0.67256456 |
| H,W | 3.2725590 |  | 0.65567121 |

**LSMeans Differences Tukey HSD**

| **Level** |  |  |  |  |  |  | **Least Sq Mean** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| C,W | A |  |  |  |  |  | 6.3500000 |
| H,NW | A | B |  |  |  |  | 5.6033025 |
| C,NW | A | B |  |  |  |  | 4.9750000 |
| H,W |  | B |  |  |  |  | 3.2725590 |

Levels not connected by same letter are significantly different.

**INOC\*SHADE**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| C,NS | 2.1750000 |  | 0.66295637 |
| C,S | 9.1500000 |  | 0.66295637 |
| H,NS | 2.3508615 |  | 0.66548997 |
| H,S | 6.5250000 |  | 0.66295637 |

**LSMeans Differences Tukey HSD**

α=

0.050 Q=

2.60085

LSMean[i] By LSMean[j]

| **Level** |  |  |  |  |  |  | **Least Sq Mean** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| C,S | A |  |  |  |  |  | 9.1500000 |
| H,S |  | B |  |  |  |  | 6.5250000 |
| H,NS |  |  | C |  |  |  | 2.3508615 |
| C,NS |  |  | C |  |  |  | 2.1750000 |

Levels not connected by same letter are significantly different.

**INOC\*ROUGHENING**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| C,NR | 5.7500000 |  | 0.66295637 |
| C,R | 5.5750000 |  | 0.66295637 |
| H,NR | 4.9475590 |  | 0.65567121 |
| H,R | 3.9283025 |  | 0.67256456 |

**INOC\*WATER\*SOIL TYPE**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| C,NW,1 | 0.850000 |  | 0.93756190 |
| C,NW,2 | 9.100000 |  | 0.93756190 |
| C,W,1 | 1.000000 |  | 0.93756190 |
| C,W,2 | 11.700000 |  | 0.93756190 |
| H,NW,1 | 1.156605 |  | 0.96454654 |
| H,NW,2 | 10.050000 |  | 0.93756190 |
| H,W,1 | 1.095118 |  | 0.91684057 |
| H,W,2 | 5.450000 |  | 0.93756190 |

**LSMeans Differences Tukey HSD**

| **Level** |  |  |  |  |  |  | **Least Sq Mean** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| C,W,2 | A |  |  |  |  |  | 11.700000 |
| H,NW,2 | A |  |  |  |  |  | 10.050000 |
| C,NW,2 | A | B |  |  |  |  | 9.100000 |
| H,W,2 |  | B |  |  |  |  | 5.450000 |
| H,NW,1 |  |  | C |  |  |  | 1.156605 |
| H,W,1 |  |  | C |  |  |  | 1.095118 |
| C,W,1 |  |  | C |  |  |  | 1.000000 |
| C,NW,1 |  |  | C |  |  |  | 0.850000 |

Levels not connected by same letter are significantly different.

**INOC\*SHADE\*SOIL TYPE**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| C,NS,1 | 0.350000 |  | 0.93756190 |
| C,NS,2 | 4.000000 |  | 0.93756190 |
| C,S,1 | 1.500000 |  | 0.93756190 |
| C,S,2 | 16.800000 |  | 0.93756190 |
| H,NS,1 | 0.601723 |  | 0.94471441 |
| H,NS,2 | 4.100000 |  | 0.93756190 |
| H,S,1 | 1.650000 |  | 0.93756190 |
| H,S,2 | 11.400000 |  | 0.93756190 |

**LSMeans Differences Tukey HSD**

| **Level** |  |  |  |  |  |  | **Least Sq Mean** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| C,S,2 | A |  |  |  |  |  | 16.800000 |
| H,S,2 |  | B |  |  |  |  | 11.400000 |
| H,NS,2 |  |  | C |  |  |  | 4.100000 |
| C,NS,2 |  |  | C |  |  |  | 4.000000 |
| H,S,1 |  |  | C |  |  |  | 1.650000 |
| C,S,1 |  |  | C |  |  |  | 1.500000 |
| H,NS,1 |  |  | C |  |  |  | 0.601723 |
| C,NS,1 |  |  | C |  |  |  | 0.350000 |

Levels not connected by same letter are significantly different.

**INOC\*ROUGHENING\*SOIL TYPE**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| C,NR,1 | 1.250000 |  | 0.93756190 |
| C,NR,2 | 10.250000 |  | 0.93756190 |
| C,R,1 | 0.600000 |  | 0.93756190 |
| C,R,2 | 10.550000 |  | 0.93756190 |
| H,NR,1 | 1.345118 |  | 0.91684057 |
| H,NR,2 | 8.550000 |  | 0.93756190 |
| H,R,1 | 0.906605 |  | 0.96454654 |
| H,R,2 | 6.950000 |  | 0.93756190 |

**INOC\*WATER\*SHADE**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| C,NW,NS | 2.173564 |  | 0.87711878 |
| C,NW,S | 7.776436 |  | 0.87711878 |
| C,W,NS | 2.176436 |  | 0.87711878 |
| C,W,S | 10.523564 |  | 0.87711878 |
| H,NW,NS | 2.830169 |  | 0.89883439 |
| H,NW,S | 8.376436 |  | 0.87711878 |
| H,W,NS | 1.871554 |  | 0.86057435 |
| H,W,S | 4.673564 |  | 0.87711878 |

**LSMeans Differences Tukey HSD**

| **Level** |  |  |  |  |  |  | **Least Sq Mean** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| C,W,S | A |  |  |  |  |  | 10.523564 |
| H,NW,S | A |  |  |  |  |  | 8.376436 |
| C,NW,S | A | B |  |  |  |  | 7.776436 |
| H,W,S |  | B | C |  |  |  | 4.673564 |
| H,NW,NS |  |  | C |  |  |  | 2.830169 |
| C,W,NS |  |  | C |  |  |  | 2.176436 |
| C,NW,NS |  |  | C |  |  |  | 2.173564 |
| H,W,NS |  |  | C |  |  |  | 1.871554 |

Levels not connected by same letter are significantly different.

**INOC\*WATER\*ROUGHENING**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| C,NW,NR | 4.9127154 |  | 0.87712877 |
| C,NW,R | 5.0372846 |  | 0.87712877 |
| C,W,NR | 6.5872846 |  | 0.87712877 |
| C,W,R | 6.1127154 |  | 0.87712877 |
| H,NW,NR | 6.2627154 |  | 0.87712877 |
| H,NW,R | 4.9438896 |  | 0.89876613 |
| H,W,NR | 3.6324027 |  | 0.86050305 |
| H,W,R | 2.9127154 |  | 0.87712877 |

**INOC\*SHADE\*ROUGHENING**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| C,NS,NR | 2.3889359 |  | 0.87711878 |
| C,NS,R | 1.9610641 |  | 0.87711878 |
| C,S,NR | 9.1110641 |  | 0.87711878 |
| C,S,R | 9.1889359 |  | 0.87711878 |
| H,NS,NR | 2.7340539 |  | 0.86057435 |
| H,NS,R | 1.9676691 |  | 0.89883439 |
| H,S,NR | 7.1610641 |  | 0.87711878 |
| H,S,R | 5.8889359 |  | 0.87711878 |

**INOC\*WATER\*SHADE\*SOIL TYPE**

**INOC\*WATER\*ROUGHENING\*SOIL TYPE**

**INOC\*SHADE\*ROUGHENING\*SOIL TYPE**

**INOC\*SHADE\*ROUGHENING\*SOIL TYPE\*WATER**

**Prediction Profiler**

Exp 3 – SEEDING

**Least Squares Fit**

**Response % crust cover Oct 24**

**Actual by Predicted Plot**



**Analysis of Variance**

| **Source** | **DF** | **Sum of Squares** | **Mean Square** | **F Ratio** |
| --- | --- | --- | --- | --- |
| Model | 15 | 1752.4875 | 116.833 | 13.6149 |
| Error | 64 | 549.2000 | 8.581 | **Prob > F** |
| C. Total | 79 | 2301.6875 |  | <.0001\* |

**Parameter Estimates**

**Effect Tests**

| **Source** | **Nparm** | **DF** | **Sum of Squares** | **F Ratio** | **Prob > F** |  |
| --- | --- | --- | --- | --- | --- | --- |
| SOIL TYPE | 1 | 1 | 535.61250 | 62.4166 | <.0001\* |  |
| INOC | 1 | 1 | 973.01250 | 113.3882 | <.0001\* |  |
| burial | 1 | 1 | 0.11250 | 0.0131 | 0.9092 |  |
| seed density | 1 | 1 | 0.01250 | 0.0015 | 0.9697 |  |
| SOIL TYPE\*INOC | 1 | 1 | 183.01250 | 21.3270 | <.0001\* |  |
| SOIL TYPE\*burial | 1 | 1 | 6.61250 | 0.7706 | 0.3833 |  |
| SOIL TYPE\*seed density | 1 | 1 | 4.51250 | 0.5259 | 0.4710 |  |
| INOC\*burial | 1 | 1 | 0.11250 | 0.0131 | 0.9092 |  |
| INOC\*seed density | 1 | 1 | 9.11250 | 1.0619 | 0.3067 |  |
| burial\*seed density | 1 | 1 | 13.61250 | 1.5863 | 0.2124 |  |
| burial\*seed density\*INOC | 1 | 1 | 6.61250 | 0.7706 | 0.3833 |  |
| INOC\*burial\*SOIL TYPE | 1 | 1 | 4.51250 | 0.5259 | 0.4710 |  |
| INOC\*seed density\*SOIL TYPE | 1 | 1 | 5.51250 | 0.6424 | 0.4258 |  |
| burial\*seed density\*INOC\*SOIL TYPE | 1 | 1 | 1.01250 | 0.1180 | 0.7324 |  |
| burial\*seed density\*SOIL TYPE | 1 | 1 | 9.11250 | 1.0619 | 0.3067 |  |

**Sorted Parameter Estimates**

**Effect Details**

**SOIL TYPE**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| 1 | 9.1500000 |  | 0.46317518 | 9.15000 |
| 2 | 3.9750000 |  | 0.46317518 | 3.97500 |

**INOC**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| C | 3.075000 |  | 0.46317518 | 3.0750 |
| H | 10.050000 |  | 0.46317518 | 10.0500 |

**burial**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| B | 6.6000000 |  | 0.46317518 | 6.60000 |
| UB | 6.5250000 |  | 0.46317518 | 6.52500 |

**seed density**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| HS | 6.5500000 |  | 0.46317518 | 6.55000 |
| LS | 6.5750000 |  | 0.46317518 | 6.57500 |

**SOIL TYPE\*INOC**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| 1,C | 4.150000 |  | 0.65502863 |
| 1,H | 14.150000 |  | 0.65502863 |
| 2,C | 2.000000 |  | 0.65502863 |
| 2,H | 5.950000 |  | 0.65502863 |

**LSMeans Differences Tukey HSD**

α=

0.050 Q=

2.63784

LSMean[i] By LSMean[j]

| **Level** |  |  |  |  |  |  | **Least Sq Mean** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1,H | A |  |  |  |  |  | 14.150000 |
| 2,H |  | B |  |  |  |  | 5.950000 |
| 1,C |  | B | C |  |  |  | 4.150000 |
| 2,C |  |  | C |  |  |  | 2.000000 |

Levels not connected by same letter are significantly different.

**SOIL TYPE\*burial**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| 1,B | 8.9000000 |  | 0.65502863 |
| 1,UB | 9.4000000 |  | 0.65502863 |
| 2,B | 4.3000000 |  | 0.65502863 |
| 2,UB | 3.6500000 |  | 0.65502863 |

**SOIL TYPE\*seed density**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| 1,HS | 8.9000000 |  | 0.65502863 |
| 1,LS | 9.4000000 |  | 0.65502863 |
| 2,HS | 4.2000000 |  | 0.65502863 |
| 2,LS | 3.7500000 |  | 0.65502863 |

**INOC\*burial**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| C,B | 3.150000 |  | 0.65502863 |
| C,UB | 3.000000 |  | 0.65502863 |
| H,B | 10.050000 |  | 0.65502863 |
| H,UB | 10.050000 |  | 0.65502863 |

**INOC\*seed density**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| C,HS | 3.400000 |  | 0.65502863 |
| C,LS | 2.750000 |  | 0.65502863 |
| H,HS | 9.700000 |  | 0.65502863 |
| H,LS | 10.400000 |  | 0.65502863 |

**burial\*seed density**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| B,HS | 7.0000000 |  | 0.65502863 |
| B,LS | 6.2000000 |  | 0.65502863 |
| UB,HS | 6.1000000 |  | 0.65502863 |
| UB,LS | 6.9500000 |  | 0.65502863 |

**burial\*seed density\*INOC**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| B,HS,C | 3.600000 |  | 0.92635037 |
| B,HS,H | 10.400000 |  | 0.92635037 |
| B,LS,C | 2.700000 |  | 0.92635037 |
| B,LS,H | 9.700000 |  | 0.92635037 |
| UB,HS,C | 3.200000 |  | 0.92635037 |
| UB,HS,H | 9.000000 |  | 0.92635037 |
| UB,LS,C | 2.800000 |  | 0.92635037 |
| UB,LS,H | 11.100000 |  | 0.92635037 |

**INOC\*burial\*SOIL TYPE**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| C,B,1 | 3.700000 |  | 0.92635037 |
| C,B,2 | 2.600000 |  | 0.92635037 |
| C,UB,1 | 4.600000 |  | 0.92635037 |
| C,UB,2 | 1.400000 |  | 0.92635037 |
| H,B,1 | 14.100000 |  | 0.92635037 |
| H,B,2 | 6.000000 |  | 0.92635037 |
| H,UB,1 | 14.200000 |  | 0.92635037 |
| H,UB,2 | 5.900000 |  | 0.92635037 |

**INOC\*seed density\*SOIL TYPE**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| C,HS,1 | 4.500000 |  | 0.92635037 |
| C,HS,2 | 2.300000 |  | 0.92635037 |
| C,LS,1 | 3.800000 |  | 0.92635037 |
| C,LS,2 | 1.700000 |  | 0.92635037 |
| H,HS,1 | 13.300000 |  | 0.92635037 |
| H,HS,2 | 6.100000 |  | 0.92635037 |
| H,LS,1 | 15.000000 |  | 0.92635037 |
| H,LS,2 | 5.800000 |  | 0.92635037 |

**burial\*seed density\*INOC\*SOIL TYPE**

**burial\*seed density\*SOIL TYPE**

**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| B,HS,1 | 9.400000 |  | 0.92635037 |
| B,HS,2 | 4.600000 |  | 0.92635037 |
| B,LS,1 | 8.400000 |  | 0.92635037 |
| B,LS,2 | 4.000000 |  | 0.92635037 |
| UB,HS,1 | 8.400000 |  | 0.92635037 |
| UB,HS,2 | 3.800000 |  | 0.92635037 |
| UB,LS,1 | 10.400000 |  | 0.92635037 |
| UB,LS,2 | 3.500000 |  | 0.92635037 |

**Response % plant cover Oct 24 2013**

**Actual by Predicted Plot**



**Analysis of Variance**

| **Source** | **DF** | **Sum of Squares** | **Mean Square** | **F Ratio** |
| --- | --- | --- | --- | --- |
| Model | 15 | 109.28750 | 7.28583 | 3.7483 |
| Error | 64 | 124.40000 | 1.94375 | **Prob > F** |
| C. Total | 79 | 233.68750 |  | 0.0001\* |

**Parameter Estimates**

**Effect Tests**

| **Source** | **Nparm** | **DF** | **Sum of Squares** | **F Ratio** | **Prob > F** |  |
| --- | --- | --- | --- | --- | --- | --- |
| SOIL TYPE | 1 | 1 | 99.012500 | 50.9389 | <.0001\* |  |
| INOC | 1 | 1 | 2.812500 | 1.4469 | 0.2334 |  |
| burial | 1 | 1 | 0.012500 | 0.0064 | 0.9363 |  |
| seed density | 1 | 1 | 0.112500 | 0.0579 | 0.8107 |  |
| SOIL TYPE\*INOC | 1 | 1 | 0.612500 | 0.3151 | 0.5765 |  |
| SOIL TYPE\*burial | 1 | 1 | 1.012500 | 0.5209 | 0.4731 |  |
| SOIL TYPE\*seed density | 1 | 1 | 0.112500 | 0.0579 | 0.8107 |  |
| INOC\*burial | 1 | 1 | 1.012500 | 0.5209 | 0.4731 |  |
| INOC\*seed density | 1 | 1 | 1.012500 | 0.5209 | 0.4731 |  |
| burial\*seed density | 1 | 1 | 0.012500 | 0.0064 | 0.9363 |  |
| burial\*seed density\*INOC | 1 | 1 | 0.612500 | 0.3151 | 0.5765 |  |
| INOC\*burial\*SOIL TYPE | 1 | 1 | 1.512500 | 0.7781 | 0.3810 |  |
| INOC\*seed density\*SOIL TYPE | 1 | 1 | 0.312500 | 0.1608 | 0.6898 |  |
| burial\*seed density\*INOC\*SOIL TYPE | 1 | 1 | 1.012500 | 0.5209 | 0.4731 |  |
| burial\*seed density\*SOIL TYPE | 1 | 1 | 0.112500 | 0.0579 | 0.8107 |  |

Exp 4 – control vs straw

**Least Squares Fit**

**Response % crust cover Oct 24**

**Whole Model**

**Actual by Predicted Plot**



**Parameter Estimates**

| **Term** |  | **Estimate** | **Std Error** | **t Ratio** | **Prob>|t|** |
| --- | --- | --- | --- | --- | --- |
| Intercept |  | 3.3214286 | 0.362601 | 9.16 | <.0001\* |
| SOIL TYPE[1] |  | -0.25 | 0.362601 | -0.69 | 0.4969 |
| stability[N] |  | -1.892857 | 0.362601 | -5.22 | <.0001\* |

**Effect Tests**

| **Source** | **Nparm** | **DF** | **Sum of Squares** | **F Ratio** | **Prob > F** |  |
| --- | --- | --- | --- | --- | --- | --- |
| SOIL TYPE | 1 | 1 | 1.75000 | 0.4754 | 0.4969 |  |
| stability | 1 | 1 | 100.32143 | 27.2507 | <.0001\* |  |

**Residual by Predicted Plot**



**SOIL TYPE**

**Leverage Plot**



**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| 1 | 3.0714286 |  | 0.51279546 | 3.07143 |
| 2 | 3.5714286 |  | 0.51279546 | 3.57143 |

**stability**

**Leverage Plot**



**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| N | 1.4285714 |  | 0.51279546 | 1.42857 |
| St | 5.2142857 |  | 0.51279546 | 5.21429 |

**Response % plant cover Oct 24 2013**

**Whole Model**

**Actual by Predicted Plot**



**Parameter Estimates**

| **Term** |  | **Estimate** | **Std Error** | **t Ratio** | **Prob>|t|** |
| --- | --- | --- | --- | --- | --- |
| Intercept |  | 0.6428571 | 0.208003 | 3.09 | 0.0049\* |
| SOIL TYPE[1] |  | -0.642857 | 0.208003 | -3.09 | 0.0049\* |
| stability[N] |  | 0.1428571 | 0.208003 | 0.69 | 0.4985 |

**Residual by Predicted Plot**



**SOIL TYPE**

**Leverage Plot**



**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| 1 | -2.22e-16 |  | 0.29416086 | -2.2e-16 |
| 2 | 1.285714 |  | 0.29416086 | 1.2857 |

**stability**

**Leverage Plot**



**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| N | 0.78571429 |  | 0.29416086 | 0.785714 |
| St | 0.50000000 |  | 0.29416086 | 0.500000 |

ALL OTHER Exp 4

**Least Squares Fit**

**Response % crust cover Oct 24**

**Whole Model**

**Actual by Predicted Plot**



**Parameter Estimates**

**Effect Tests**

| **Source** | **Nparm** | **DF** | **Sum of Squares** | **F Ratio** | **Prob > F** |  |
| --- | --- | --- | --- | --- | --- | --- |
| SOIL TYPE | 1 | 1 | 40.2992 | 8.1897 | 0.0050\* |  |
| INOC | 1 | 1 | 1369.8596 | 278.3877 | <.0001\* |  |
| stability | 4 | 4 | 289.8426 | 14.7257 | <.0001\* |  |
| SOIL TYPE\*INOC | 1 | 1 | 78.0464 | 15.8609 | 0.0001\* |  |
| SOIL TYPE\*stability | 4 | 4 | 16.4732 | 0.8369 | 0.5044 |  |
| INOC\*stability | 4 | 4 | 243.4732 | 12.3699 | <.0001\* |  |
| INOC\*stability\*SOIL TYPE | 4 | 4 | 5.6308 | 0.2861 | 0.8865 |  |

**Residual by Predicted Plot**



**SOIL TYPE**

**Leverage Plot**



**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| 1 | 5.0657143 |  | 0.27038378 | 4.80882 |
| 2 | 3.9714286 |  | 0.27038378 | 3.76471 |

**INOC**

**Leverage Plot**



**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| C | 1.3285714 |  | 0.26513311 | 1.32857 |
| H | 7.7085714 |  | 0.27553441 | 7.42424 |

**stability**

**Leverage Plot**



**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| N | 6.9142857 |  | 0.45922402 | 6.00000 |
| P1 | 3.2500000 |  | 0.41921226 | 3.25000 |
| P2 | 3.5000000 |  | 0.41921226 | 3.50000 |
| P3 | 3.2500000 |  | 0.41921226 | 3.25000 |
| WSP | 5.6785714 |  | 0.41921226 | 5.67857 |

**LSMeans Differences Tukey HSD**

α=

0.050 Q=

2.77115

LSMean[i] By LSMean[j]

| **Level** |  |  |  |  |  |  | **Least Sq Mean** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| N | A |  |  |  |  |  | 6.9142857 |
| WSP | A |  |  |  |  |  | 5.6785714 |
| P2 |  | B |  |  |  |  | 3.5000000 |
| P1 |  | B |  |  |  |  | 3.2500000 |
| P3 |  | B |  |  |  |  | 3.2500000 |

Levels not connected by same letter are significantly different.

**SOIL TYPE\*INOC**

**Leverage Plot**



**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| 1,C | 1.1142857 |  | 0.37495484 |
| 1,H | 9.0171429 |  | 0.38966450 |
| 2,C | 1.5428571 |  | 0.37495484 |
| 2,H | 6.4000000 |  | 0.38966450 |

**LSMeans Differences Tukey HSD**

α=

0.050 Q=

2.60667

LSMean[i] By LSMean[j]

| **Level** |  |  |  |  |  |  | **Least Sq Mean** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1,H | A |  |  |  |  |  | 9.0171429 |
| 2,H |  | B |  |  |  |  | 6.4000000 |
| 2,C |  |  | C |  |  |  | 1.5428571 |
| 1,C |  |  | C |  |  |  | 1.1142857 |

Levels not connected by same letter are significantly different.

**SOIL TYPE\*stability**

**Leverage Plot**



**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| 1,N | 7.6857143 |  | 0.64944084 |
| 1,P1 | 3.8571429 |  | 0.59285566 |
| 1,P2 | 3.7142857 |  | 0.59285566 |
| 1,P3 | 3.3571429 |  | 0.59285566 |
| 1,WSP | 6.7142857 |  | 0.59285566 |
| 2,N | 6.1428571 |  | 0.64944084 |
| 2,P1 | 2.6428571 |  | 0.59285566 |
| 2,P2 | 3.2857143 |  | 0.59285566 |
| 2,P3 | 3.1428571 |  | 0.59285566 |
| 2,WSP | 4.6428571 |  | 0.59285566 |

**INOC\*stability**

**Leverage Plot**



**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| C,N | 1.428571 |  | 0.59285566 |
| C,P1 | 0.928571 |  | 0.59285566 |
| C,P2 | 1.071429 |  | 0.59285566 |
| C,P3 | 1.571429 |  | 0.59285566 |
| C,WSP | 1.642857 |  | 0.59285566 |
| H,N | 12.400000 |  | 0.70147628 |
| H,P1 | 5.571429 |  | 0.59285566 |
| H,P2 | 5.928571 |  | 0.59285566 |
| H,P3 | 4.928571 |  | 0.59285566 |
| H,WSP | 9.714286 |  | 0.59285566 |

**LSMeans Differences Tukey HSD**

α=

0.050 Q=

3.22619

LSMean[i] By LSMean[j]

| **Level** |  |  |  |  |  |  | **Least Sq Mean** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| H,N | A |  |  |  |  |  | 12.400000 |
| H,WSP | A |  |  |  |  |  | 9.714286 |
| H,P2 |  | B |  |  |  |  | 5.928571 |
| H,P1 |  | B |  |  |  |  | 5.571429 |
| H,P3 |  | B |  |  |  |  | 4.928571 |
| C,WSP |  |  | C |  |  |  | 1.642857 |
| C,P3 |  |  | C |  |  |  | 1.571429 |
| C,N |  |  | C |  |  |  | 1.428571 |
| C,P2 |  |  | C |  |  |  | 1.071429 |
| C,P1 |  |  | C |  |  |  | 0.928571 |

Levels not connected by same letter are significantly different.

**INOC\*stability\*SOIL TYPE**

**Leverage Plot**



**Response % plant cover Oct 24 2013**

**Whole Model**

**Actual by Predicted Plot**



**Parameter Estimates**

**Effect Tests**

| **Source** | **Nparm** | **DF** | **Sum of Squares** | **F Ratio** | **Prob > F** |  |
| --- | --- | --- | --- | --- | --- | --- |
| SOIL TYPE | 1 | 1 | 103.90797 | 29.2881 | <.0001\* |  |
| INOC | 1 | 1 | 11.32115 | 3.1911 | 0.0767 |  |
| stability | 4 | 4 | 118.40172 | 8.3434 | <.0001\* |  |
| SOIL TYPE\*INOC | 1 | 1 | 4.29258 | 1.2099 | 0.2736 |  |
| SOIL TYPE\*stability | 4 | 4 | 46.86576 | 3.3025 | 0.0133\* |  |
| INOC\*stability | 4 | 4 | 25.99778 | 1.8320 | 0.1274 |  |
| INOC\*stability\*SOIL TYPE | 4 | 4 | 31.63424 | 2.2292 | 0.0701 |  |

**Residual by Predicted Plot**



**SOIL TYPE**

**Leverage Plot**



**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| 1 | 0.9400000 |  | 0.22958642 | 0.95588 |
| 2 | 2.6971429 |  | 0.22958642 | 2.61765 |

**INOC**

**Leverage Plot**



**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| C | 1.5285714 |  | 0.22512800 | 1.52857 |
| H | 2.1085714 |  | 0.23395988 | 2.06061 |

**stability**

**Leverage Plot**



**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** | **Mean** |
| --- | --- | --- | --- | --- |
| N | 1.8428571 |  | 0.38993314 | 1.66667 |
| P1 | 1.0000000 |  | 0.35595863 | 1.00000 |
| P2 | 0.9642857 |  | 0.35595863 | 0.96429 |
| P3 | 1.7857143 |  | 0.35595863 | 1.78571 |
| WSP | 3.5000000 |  | 0.35595863 | 3.50000 |

**LSMeans Differences Tukey HSD**

α=

0.050 Q=

2.77115

LSMean[i] By LSMean[j]

| **Level** |  |  |  |  |  |  | **Least Sq Mean** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| WSP | A |  |  |  |  |  | 3.5000000 |
| N |  | B |  |  |  |  | 1.8428571 |
| P3 |  | B |  |  |  |  | 1.7857143 |
| P1 |  | B |  |  |  |  | 1.0000000 |
| P2 |  | B |  |  |  |  | 0.9642857 |

Levels not connected by same letter are significantly different.

**SOIL TYPE\*INOC**

**Leverage Plot**



**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| 1,C | 0.8285714 |  | 0.31837908 |
| 1,H | 1.0514286 |  | 0.33086924 |
| 2,C | 2.2285714 |  | 0.31837908 |
| 2,H | 3.1657143 |  | 0.33086924 |

**SOIL TYPE\*stability**

**Leverage Plot**



**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| 1,N | 0.2000000 |  | 0.55144873 |
| 1,P1 | 0.7142857 |  | 0.50340152 |
| 1,P2 | 0.8571429 |  | 0.50340152 |
| 1,P3 | 0.4285714 |  | 0.50340152 |
| 1,WSP | 2.5000000 |  | 0.50340152 |
| 2,N | 3.4857143 |  | 0.55144873 |
| 2,P1 | 1.2857143 |  | 0.50340152 |
| 2,P2 | 1.0714286 |  | 0.50340152 |
| 2,P3 | 3.1428571 |  | 0.50340152 |
| 2,WSP | 4.5000000 |  | 0.50340152 |

**LSMeans Differences Tukey HSD**

α=

0.050 Q=

3.22619

LSMean[i] By LSMean[j]

| **Level** |  |  |  |  |  |  | **Least Sq Mean** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 2,WSP | A |  |  |  |  |  | 4.5000000 |
| 2,N | A | B |  |  |  |  | 3.4857143 |
| 2,P3 | A | B | C |  |  |  | 3.1428571 |
| 1,WSP | A | B | C | D |  |  | 2.5000000 |
| 2,P1 |  | B | C | D |  |  | 1.2857143 |
| 2,P2 |  |  | C | D |  |  | 1.0714286 |
| 1,P2 |  |  | C | D |  |  | 0.8571429 |
| 1,P1 |  |  |  | D |  |  | 0.7142857 |
| 1,P3 |  |  |  | D |  |  | 0.4285714 |
| 1,N |  |  |  | D |  |  | 0.2000000 |

Levels not connected by same letter are significantly different.

**INOC\*stability**

**Leverage Plot**



**Least Squares Means Table**

| **Level** | **Least Sq Mean** |  | **Std Error** |
| --- | --- | --- | --- |
| C,N | 0.7857143 |  | 0.50340152 |
| C,P1 | 0.8571429 |  | 0.50340152 |
| C,P2 | 0.6428571 |  | 0.50340152 |
| C,P3 | 1.5000000 |  | 0.50340152 |
| C,WSP | 3.8571429 |  | 0.50340152 |
| H,N | 2.9000000 |  | 0.59563271 |
| H,P1 | 1.1428571 |  | 0.50340152 |
| H,P2 | 1.2857143 |  | 0.50340152 |
| H,P3 | 2.0714286 |  | 0.50340152 |
| H,WSP | 3.1428571 |  | 0.50340152 |

**INOC\*stability\*SOIL TYPE**

**Leverage Plot**

