

MSU Soil Fertility Research Program

RESPONSE OF POTATO TO PHOSPHORUS AT REDUCED AND INCREASED RATES

Trial ID: PMRF04-14 Location: MRF Trial Year: 2014

Investigator: Kurt Steinke

Project ID: PHOSPOT

| Crop Code<br>Crop Name<br>Crop Variety<br>Description<br>Rating Date<br>Rating Type<br>Rating Unit<br>ARM Action Codes |                |           |           |                |            |                 | SOLTU<br>Potato<br>FL 2137<br>harvest<br>Sep-17-2014<br>YIELD<br>CWT/B'S<br>TY1 | SOLTU<br>Potato<br>FL 2137<br>harvest<br>Sep-17-2014<br>YIELD<br>CWT/OS<br>TY2 | SOLTU<br>Potato<br>FL 2137<br>harvest<br>Sep-17-2014<br>YIELD<br>CWT/A'S<br>ET5 TY3 | SOLTU<br>Potato<br>FL 2137<br>harvest<br>Sep-17-2014<br>Total Yield<br>CWT<br>T4 |         |
|--|----------------|-----------|-----------|----------------|------------|-----------------|---|--|---|--|---------|
| Trt No.  | Treatment Name | Form Conc | Form Type | Rate Rate Unit | Other Rate | Other Rate Unit | Growth Stage  | 67   | 68  | 69   | 70      |
| 1  | TSP-PHOS       | 45 GR     |           | 0 lb ai/a      |            |                 |   | 10.5 a   | 20.9 a  | 232.1 a  | 275.9 b |
|  | K2O 0-0-62     | 62 GR     |           | 105 lb ai/a    | 170 lb/a   |                 | PPI   |  |   |  |         |
|  | K2O 0-0-62     | 62 GR     |           | 100 lb ai/a    | 161 lb/a   |                 | APBAND  |  |   |  |         |
|  | GYP SUM        | 16 GR     |           | 500 lb/a       | 500 lb/a   |                 | PPI   |  |   |  |         |
|  | K-Mag          | 22 GR     |           | 250 lb/a       | 250 lb/a   |                 | PPI   |  |   |  |         |
|  | Urea 46-0-0    | 46 GR     |           | 25 lb ai/a     | 54.3 lb/a  |                 | APBAND  |  |   |  |         |
|  | AS (21-0-0)-N  | 21 GR     |           | 83 lb ai/a     | 395 lb/a   |                 | EMBAND  |  |   |  |         |
|  | Urea 46-0-0    | 46 GR     |           | 167 lb ai/a    | 363 lb/a   |                 | BHILL   |  |   |  |         |
|  | K-Mag          | 22 GR     |           | 180 lb/a       | 180 lb/a   |                 | BHILL   |  |   |  |         |
| 2  | TSP-PHOS       | 45 GR     |           | 40 lb ai/a     | 89 lb/a    |                 | APBAND  | 10.0 a   | 37.6 a  | 252.5 a  | 300.1 b |
|  | K2O 0-0-62     | 62 GR     |           | 105 lb ai/a    | 170 lb/a   |                 | PPI   |  |   |  |         |
|  | K2O 0-0-62     | 62 GR     |           | 100 lb ai/a    | 161 lb/a   |                 | APBAND  |  |   |  |         |
|  | GYP SUM        | 16 GR     |           | 500 lb/a       | 500 lb/a   |                 | PPI   |  |   |  |         |
|  | K-Mag          | 22 GR     |           | 250 lb/a       | 250 lb/a   |                 | PPI   |  |   |  |         |
|  | Urea 46-0-0    | 46 GR     |           | 25 lb ai/a     | 54.3 lb/a  |                 | APBAND  |  |   |  |         |
|  | AS (21-0-0)-N  | 21 GR     |           | 83 lb ai/a     | 395 lb/a   |                 | EMBAND  |  |   |  |         |
|  | Urea 46-0-0    | 46 GR     |           | 167 lb ai/a    | 363 lb/a   |                 | BHILL   |  |   |  |         |
|  | K-Mag          | 22 GR     |           | 180 lb/a       | 180 lb/a   |                 | BHILL   |  |   |  |         |
| 3  | TSP-PHOS       | 45 GR     |           | 80 lb ai/a     | 178 lb/a   |                 | APBAND  | 9.3 a  | 54.2 a  | 202.6 a  | 266.1 b |
|  | K2O 0-0-62     | 62 GR     |           | 105 lb ai/a    | 170 lb/a   |                 | PPI   |  |   |  |         |
|  | K2O 0-0-62     | 62 GR     |           | 100 lb ai/a    | 161 lb/a   |                 | APBAND  |  |   |  |         |
|  | GYP SUM        | 16 GR     |           | 500 lb/a       | 500 lb/a   |                 | PPI   |  |   |  |         |
|  | K-Mag          | 22 GR     |           | 250 lb/a       | 250 lb/a   |                 | PPI   |  |   |  |         |
|  | Urea 46-0-0    | 46 GR     |           | 25 lb ai/a     | 54.3 lb/a  |                 | APBAND  |  |   |  |         |
|  | AS (21-0-0)-N  | 21 GR     |           | 83 lb ai/a     | 395 lb/a   |                 | EMBAND  |  |   |  |         |
|  | Urea 46-0-0    | 46 GR     |           | 167 lb ai/a    | 363 lb/a   |                 | BHILL   |  |   |  |         |
|  | K-Mag          | 22 GR     |           | 180 lb/a       | 180 lb/a   |                 | BHILL   |  |   |  |         |
| 4  | TSP-PHOS       | 45 GR     |           | 120 lb ai/a    | 267 lb/a   |                 | APBAND  | 7.2 a  | 48.2 a  | 233.8 a  | 289.1 b |
|  | K2O 0-0-62     | 62 GR     |           | 105 lb ai/a    | 170 lb/a   |                 | PPI   |  |   |  |         |
|  | K2O 0-0-62     | 62 GR     |           | 100 lb ai/a    | 161 lb/a   |                 | APBAND  |  |   |  |         |
|  | GYP SUM        | 16 GR     |           | 500 lb/a       | 500 lb/a   |                 | PPI   |  |   |  |         |
|  | K-Mag          | 22 GR     |           | 250 lb/a       | 250 lb/a   |                 | PPI   |  |   |  |         |
|  | Urea 46-0-0    | 46 GR     |           | 25 lb ai/a     | 54.3 lb/a  |                 | APBAND  |  |   |  |         |
|  | AS (21-0-0)-N  | 21 GR     |           | 83 lb ai/a     | 395 lb/a   |                 | EMBAND  |  |   |  |         |
|  | Urea 46-0-0    | 46 GR     |           | 167 lb ai/a    | 363 lb/a   |                 | BHILL   |  |   |  |         |
|  | K-Mag          | 22 GR     |           | 180 lb/a       | 180 lb/a   |                 | BHILL   |  |   |  |         |
| 5  | TSP-PHOS       | 45 GR     |           | 160 lb ai/a    | 356 lb/a   |                 | APBAND  | 9.0 a  | 64.6 a  | 294.3  | 368.0 a |
|  | K2O 0-0-62     | 62 GR     |           | 105 lb ai/a    | 170 lb/a   |                 | PPI   |  |   |  |         |
|  | K2O 0-0-62     | 62 GR     |           | 100 lb ai/a    | 161 lb/a   |                 | APBAND  |  |   |  |         |
|  | GYP SUM        | 16 GR     |           | 500 lb/a       | 500 lb/a   |                 | PPI   |  |   |  |         |
|  | K-Mag          | 22 GR     |           | 250 lb/a       | 250 lb/a   |                 | PPI   |  |   |  |         |
|  | Urea 46-0-0    | 46 GR     |           | 25 lb ai/a     | 54.3 lb/a  |                 | APBAND  |  |   |  |         |
|  | AS (21-0-0)-N  | 21 GR     |           | 83 lb ai/a     | 395 lb/a   |                 | EMBAND  |  |   |  |         |
|  | Urea 46-0-0    | 46 GR     |           | 167 lb ai/a    | 363 lb/a   |                 | BHILL   |  |   |  |         |
|  | K-Mag          | 22 GR     |           | 180 lb/a       | 180 lb/a   |                 | BHILL   |  |   |  |         |

Means followed by same letter do not significantly differ (P=.10, LSD)

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns: Yates=68,70

MSU Soil Fertility Research Program

RESPONSE OF POTATO TO PHOSPHORUS AT REDUCED AND INCREASED RATES

Trial ID: PMRF04-14 Location: MRF Trial Year: 2014  
 Investigator: Kurt Steinke  
 Project ID: PHOSPOT

| Crop Code          |                |           |           |                |            |                 | SOLTU        | SOLTU       | SOLTU       | SOLTU       |         |
|--------------------|----------------|-----------|-----------|----------------|------------|-----------------|--------------|-------------|-------------|-------------|---------|
| Crop Name          |                |           |           |                |            |                 | Potato       | Potato      | Potato      | Potato      |         |
| Crop Variety       |                |           |           |                |            |                 | FL 2137      | FL 2137     | FL 2137     | FL 2137     |         |
| Description        |                |           |           |                |            |                 | harvest      | harvest     | harvest     | harvest     |         |
| Rating Date        |                |           |           |                |            |                 | Sep-17-2014  | Sep-17-2014 | Sep-17-2014 | Sep-17-2014 |         |
| Rating Type        |                |           |           |                |            |                 | YIELD        | YIELD       | YIELD       | Total Yield |         |
| Rating Unit        |                |           |           |                |            |                 | CWT/B'S      | CWT/OS      | CWT/A'S     | CWT         |         |
| ARM Action Codes   |                |           |           |                |            |                 | TY1          | TY2         | ET5 TY3     | T4          |         |
| Trt No.            | Treatment Name | Form Conc | Form Type | Rate Rate Unit | Other Rate | Other Rate Unit | Growth Stage | 67          | 68          | 69          | 70      |
| 6                  | TSP-PHOS       | 45        | GR        | 200 lb ai/a    | 444 lb/a   |                 | APBAND       | 5.1 a       | 67.4 a      | 276.1 a     | 348.7 a |
|                    | K2O 0-0-62     | 62        | GR        | 105 lb ai/a    | 170 lb/a   |                 | PPI          |             |             |             |         |
|                    | K2O 0-0-62     | 62        | GR        | 100 lb ai/a    | 161 lb/a   |                 | APBAND       |             |             |             |         |
|                    | GYP SUM        | 16        | GR        | 500 lb/a       | 500 lb/a   |                 | PPI          |             |             |             |         |
|                    | K-Mag          | 22        | GR        | 250 lb/a       | 250 lb/a   |                 | PPI          |             |             |             |         |
|                    | Urea 46-0-0    | 46        | GR        | 25 lb ai/a     | 54.3 lb/a  |                 | APBAND       |             |             |             |         |
|                    | AS (21-0-0-)N  | 21        | GR        | 83 lb ai/a     | 395 lb/a   |                 | EMBAND       |             |             |             |         |
|                    | Urea 46-0-0    | 46        | GR        | 167 lb ai/a    | 363 lb/a   |                 | BHILL        |             |             |             |         |
|                    | K-Mag          | 22        | GR        | 180 lb/a       | 180 lb/a   |                 | BHILL        |             |             |             |         |
| LSD (P=.10)        |                |           |           |                |            |                 | 3.39         | 34.48       | 51.35       | 39.98       |         |
| Standard Deviation |                |           |           |                |            |                 | 2.74         | 27.69       | 40.75       | 32.11       |         |
| CV                 |                |           |           |                |            |                 | 32.12        | 56.73       | 17.02       | 10.42       |         |
| Bartlett's X2      |                |           |           |                |            |                 | 0.653        | 10.009      | 7.879       | 10.296      |         |
| P(Bartlett's X2)   |                |           |           |                |            |                 | 0.985        | 0.075       | 0.096       | 0.067       |         |
| Skewness           |                |           |           |                |            |                 | -0.3598      | 0.9553      | -0.0799     | -0.2121     |         |
| Kurtosis           |                |           |           |                |            |                 | -1.022       | 0.6592      | -0.8023     | -0.8116     |         |
| Replicate F        |                |           |           |                |            |                 | 0.980        | 0.787       | 0.899       | 0.453       |         |
| Replicate Prob(F)  |                |           |           |                |            |                 | 0.4282       | 0.5210      | 0.4700      | 0.7190      |         |
| Treatment F        |                |           |           |                |            |                 | 2.179        | 1.595       | 1.780       | 6.559       |         |
| Treatment Prob(F)  |                |           |           |                |            |                 | 0.1114       | 0.2254      | 0.1977      | 0.0024      |         |

Crop Code  
 SOLTU, BPOT, Solanum tuberosum, = US  
Rating Type  
 YIELD = yield  
Rating Unit  
 CWT = hundredweight (u.s.=100 lb)  
ARM Action Codes  
 ET5 = Excluded treatment 5  
 TY1 = 7.329632\*[C54]  
 TY2 = 7.329632\*[C56]  
 TY3 = 7.329632\*[C60]  
 T4 = [C67]+[C68]+[C69]