Table 1. Plant height and stem diameter as a function of phosphorus doses with the addition (+) or not (-) of organic matter (OM) for three tree species.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| P doses | *Tabebuia aurea* | | *Amburana cearensis* | | *Caesalpinia ferrea* | | |
| OM+ | OM- | OM+ | OM- | OM+ | OM- | |
|  | Plant height (cm) | | | | | | |
| 0 | 72.35 | 45.10 | 23.00 | 23.50 | 81.90 | 81.25 | |
| 50 | 81.13 | 59.58 | 28.00 | 33.50 | 84.10 | 97.88 | |
| 100 | 69.50 | 58.38 | 32.38 | 36.00 | 97.28 | 106.88 | |
| 150 | 69.00 | 61.00 | 30.00 | 27.00 | 90.95 | 79.60 | |
| 200 | 74.38 | 71.63 | 22.00 | 28.63 | 106.00 | 98.03 | |
| *β1* | *ns* | *\*\** | *\** | *ns* | *\** | *ns* | |
| *Β2* | *ns* | *ns* | *\*\** | *ns* | *ns* | *ns* | |
|  | Stem diameter (mm) | | | | | | |
| 0 | 19.37 | 17.34 | 3.42 | 3.84 | 8.13 | | 7.32 |
| 50 | 19.16 | 18.44 | 4.05 | 4.49 | 8.51 | | 8.10 |
| 100 | 18.11 | 21.34 | 4.61 | 4.80 | 9.33 | | 8.01 |
| 150 | 19.25 | 21.26 | 4.31 | 4.29 | 8.05 | | 8.53 |
| 200 | 20.50 | 19.41 | 3.37 | 4.49 | 8.94 | | 8.31 |
| *β1* | *ns* | *\*\** | *\** | *\** | *ns* | | *\** |
| *Β2* | *ns* | *ns* | *\** | *\** | *ns* | | *\** |

Significance oflinear (*β1)* and quadratic (*β2)* parameters of the polynomial regression models: linear (ŷ = a + *β1*x) and quadratic (ŷ= a+*β1*x+*β2*x2). \*\* P<0.01; \* P<0.05; *ns* P>0.05.

Table 2. Dry mass of leaves and stem and root:shoot ratio as a function of phosphorus doses with the addition (+) or not (-) of organic matter (OM) for three tree species.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| P doses | *Tabebuia aurea* | | *Amburana cearensis* | | *Caesalpinia ferrea* | | |
| OM+ | OM- | OM+ | OM- | OM+ | OM- | |
|  | Leaves dry mass (g per plant) | | | | | | |
| 0 | 29.72 | 12.17 | 0.76 | 0.84 | 6.12 | 7.77 | |
| 50 | 31.12 | 19.00 | 2.12 | 1.87 | 9.67 | 10.62 | |
| 100 | 34.32 | 16.70 | 2.40 | 1.48 | 11.71 | 10.22 | |
| 150 | 31.74 | 25.98 | 1.52 | 1.38 | 12.09 | 7.67 | |
| 200 | 24.73 | 25.15 | 1.69 | 0.94 | 10.24 | 6.49 | |
| *β1* | \*\* | \* | \* | \* | \*\* | \* | |
| *Β2* | \*\* | ns | \* | \* | \*\* | \* | |
|  | Stem dry matter (g per plant) | | | | | | |
| 0 | 30.64 | 14.05 | 1.14 | 0.84 | 12.84 | | 9.29 |
| 50 | 31.98 | 23.56 | 1.94 | 1.45 | 15.12 | | 14.75 |
| 100 | 29.46 | 23.49 | 2.94 | 1.57 | 17.72 | | 18.59 |
| 150 | 30.72 | 28.69 | 1.42 | 1.47 | 19.19 | | 13.22 |
| 200 | 32.26 | 31.81 | 1.79 | 0.87 | 19.18 | | 14.41 |
| *β1* | *ns* | *\*\** | *ns* | *\*\** | *\*\** | | *\** |
| *Β2* | *ns* | *ns* | *ns* | *\*\** | *ns* | | *\** |
|  | Root:shoot ratio | | | | | | |
| 0 | 0.48 | 0.74 | 10.11 | 4.10 | 0.74 | | 1.04 |
| 50 | 0.42 | 0.58 | 5.44 | 2.29 | 0.76 | | 0.86 |
| 100 | 0.48 | 0.86 | 5.36 | 1.24 | 0.72 | | 0.64 |
| 150 | 0.49 | 0.75 | 2.44 | 1.17 | 0.64 | | 1.10 |
| 200 | 0.48 | 0.78 | 1.68 | 3.55 | 0.52 | | 0.83 |
| *β1* | *ns* | *ns* | *\** | *\** | *\** | | *ns* |
| *Β2* | *ns* | *ns* | *ns* | *\** | *ns* | | *ns* |

Significance oflinear (*β1)* and quadratic (*β2)* parameters of the polynomial regression models: linear (ŷ = a + *β1*x) and quadratic (ŷ= a+*β1*x+*β2*x2). \*\* P<0.01; \* P<0.05; *ns* P>0.05.

Table 3. Phosphorus concentration in the dry mass of leaves, stem and root as a function of phosphorus doses with the addition (+) or not (-) of organic matter (OM) for three tree species.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| P doses | *Tabebuia aurea* | | *Amburana cearensis* | | *Caesalpinia ferrea* | | |
| OM+ | OM- | OM+ | OM- | OM+ | OM- | |
|  | --------------------------P concentration (g kg-1)---------------------------------- | | | | | | |
|  | Leaves | | | | | | |
| 0 | 1.48 | 1.10 | 1.27 | 1.55 | 1.35 | 1.12 | |
| 50 | 1.40 | 1.68 | 1.44 | 1.66 | 3.18 | 1.28 | |
| 100 | 1.86 | 1.94 | 3.40 | 1.59 | 2.02 | 1.01 | |
| 150 | 2.60 | 2.57 | 1.61 | 0.97 | 2.36 | 1.60 | |
| 200 | 3.43 | 1.91 | 1.47 | 2.40 | 1.91 | 1.33 | |
| *β1* | *\** | *\** | *\** | *ns* | *ns* | *ns* | |
| *Β2* | *ns* | *\** | *\** | *ns* | *ns* | *ns* | |
|  | Stem | | | | | | |
| 0 | 0.78 | 0.65 | 0.81 | 0.56 | 1.23 | | 1.00 |
| 50 | 0.88 | 0.86 | 1.00 | 0.87 | 1.41 | | 0.95 |
| 100 | 0.89 | 0.93 | 1.63 | 1.47 | 1.06 | | 1.19 |
| 150 | 1.27 | 1.07 | 2.73 | 1.33 | 1.35 | | 1.19 |
| 200 | 1.69 | 1.16 | 2.70 | 1.67 | 1.16 | | 1.11 |
| *β1* | *\*\** | *\** | *\** | *\** | *ns* | | *ns* |
| *Β2* | *ns* | *ns* | *ns* | *ns* | *ns* | | *ns* |
|  | Root | | | | | | |
| 0 | 0.86 | 0.70 | 0.28 | 0.30 | 1.36 | | 1.06 |
| 50 | 0.82 | 1.21 | 0.29 | 0.39 | 1.47 | | 1.79 |
| 100 | 0.83 | 2.21 | 0.86 | 0.91 | 1.73 | | 1.66 |
| 150 | 1.08 | 0.93 | 1.36 | 1.11 | 1.92 | | 2.28 |
| 200 | 1.36 | 0.93 | 0.73 | 1.37 | 2.76 | | 1.99 |
| *β1* | *\** | *\** | *\** | *\*\** | *\** | | *\** |
| *Β2* | *\** | *ns* | *\** | *ns* | *ns* | | *\** |

Significance oflinear (*β1)* and quadratic (*β2)* parameters of the polynomial regression models: linear (ŷ = a + *β1*x) and quadratic (ŷ= a+*β1*x+*β2*x2). \*\* P<0.01; \* P<0.05; *ns* P>0.05.

Table 4**.** Concentrations of soluble phosphorus fractions of tree species as a function of doses of phosphorus and addition (+) or not (-) of organic matter (OM).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| P doses | *Tabebuia aurea* | | *Amburana cearensis* | | *Caesalpinia ferrea* | | |
| OM+ | OM- | OM+ | OM- | OM+ | OM- | |
|  | ------------------------------------------- mg kg-1------------------------------------------ | | | | | | |
|  | Pi (inorganic soluble P) | | | | | | |
| 0 | 81.88 | 69.65 | 19.32 | 49.52 | 97.17 | 56.15 | |
| 50 | 49.50 | 53.33 | 22.42 | 30.09 | 159.91 | 57.37 | |
| 100 | 46.14 | 71.91 | 29.39 | 107.63 | 79.36 | 36.55 | |
| 150 | 92.06 | 95.66 | 49.71 | 105.71 | 78.70 | 99.29 | |
| 200 | 89.41 | 70.61 | 83.40 | 81.95 | 76.24 | 86.08 | |
| *β1* | ns | ns | \*\* | ns | ns | ns | |
| *Β2* | ns | ns | ns | ns | ns | ns | |
|  | Po (organic soluble P) | | | | | | |
| 0 | 4.15 | 41.56 | 5.84 | 78.87 | 39.29 | | 19.54 |
| 50 | 21.49 | 13.02 | 12.37 | 16.55 | 44.85 | | 25.20 |
| 100 | 23.92 | 44.73 | 20.88 | 66.29 | 33.15 | | 23.24 |
| 150 | 46.61 | 56.76 | 30.35 | 90.55 | 24.11 | | 24.23 |
| 200 | 136.82 | 26.18 | 15.39 | 55.50 | 19.69 | | 21.93 |
| *β1* | *\*\** | *ns* | *\*\** | *\** | *\** | | *\** |
| *Β2* | *ns* | *ns* | *\*\** | *\** | *\** | | *\** |
|  | TSP (total soluble P) | | | | | | |
| 0 | 91.37 | 100.68 | 24.00 | 135.57 | 140.31 | | 75.69 |
| 50 | 75.56 | 65.33 | 30.36 | 48.60 | 129.72 | | 74.13 |
| 100 | 70.05 | 97.92 | 48.41 | 173.92 | 112.51 | | 55.74 |
| 150 | 117.44 | 152.41 | 106.01 | 196.25 | 119.83 | | 80.67 |
| 200 | 212.26 | 92.84 | 95.21 | 141.53 | 100.71 | | 101.25 |
| *β1* | *\*\** | *ns* | *\** | *\** | *\** | | *\** |
| *Β2* | *\*\** | *ns* | *ns* | *ns* | *ns* | | *\** |

Significance oflinear (*β1)* and quadratic (*β2)* parameters of the polynomial regression models: linear (ŷ = a + *β1*x) and quadratic (ŷ= a+*β1*x+*β2*x2). \*\* P<0.01; \* P<0.05; *ns* P>0.05.

Table 5. Phosphorus use efficiency (PUE) and phosphorus translocation index (PTI) as a function of phosphorus doses with the addition (+) or not (-) of organic matter (OM) for three tree species.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| P doses | *Tabebuia aurea* | | *Amburana cearensis* | | *Caesalpinia ferrea* | | |
| OM+ | OM- | OM+ | OM- | OM+ | OM- | |
|  | PUE (g2 mg-1 of P | | | | | | |
| 0 | 84.24 | 58.76 | 61.63 | 20.77 | 25.04 | 32.83 | |
| 50 | 87.18 | 62.82 | 56.66 | 19.25 | 24.70 | 33.18 | |
| 100 | 80.05 | 47.98 | 20.65 | 5.40 | 32.77 | 34.05 | |
| 150 | 54.84 | 66.30 | 6.34 | 5.32 | 28.02 | 23.84 | |
| 200 | 43.61 | 81.81 | 7.00 | 5.37 | 25.15 | 24.93 | |
| *β1* | \* | \*\* | *\*\** | *\** | *\** | \* | |
| *Β2* | \* | \* | *ns* | *ns* | *\** | \* | |
|  | PTI (%) | | | | | | |
| 0 | 73.33 | 62.59 | 26.10 | 52.08 | 58.55 | | 48.95 |
| 50 | 77.30 | 64.81 | 47.07 | 66.25 | 65.38 | | 43.30 |
| 100 | 77.67 | 45.22 | 38.44 | 58.66 | 54.19 | | 52.91 |
| 150 | 79.01 | 71.89 | 43.75 | 45.61 | 60.63 | | 36.87 |
| 200 | 79.93 | 66.92 | 65.60 | 47.44 | 48.98 | | 42.54 |
| *β1* | *ns* | *ns* | *\** | *\** | *\** | | *ns* |
| *Β2* | *ns* | *ns* | *ns* | *\** | *\** | | *ns* |

Significance oflinear (*β1)* and quadratic (*β2)* parameters of the polynomial regression models: linear (ŷ = a + *β1*x) and quadratic (ŷ= a+*β1*x+*β2*x2). \*\* P<0.01; \* P<0.05; *ns* P>0.05.