**Tables:**

Table 1. Fruit yield of ‘Paladin’ peppers grown in a Clarion loam soil. Means are averages of seven harvests. Experimental design was a split plot with four replications, on bare soil or black plastic mulch (whole plot), and four levels of biochar (0.0, 1.1, 2.2, and 4.5 kg.m-2) as sub-plot factors.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Marketable number/ha (thousands)** | **Marketable****weight (Mg/ha-1)** | **Total Non-marketablez number/ha (thousands)** | **Total Non-marketable weight****(Mg/ha-1)** | **Blossom End Rot** **number/ha (thousands)** | **Sun Scald number/ha (thousands)** |
|  | **Year** |
|  | **2012** | **2013** | **2012** | **2013** | **2012** | **2013** | **2012** | **2013** | **2012** | **2013** | **2012** | **2013** |
| **Biochar** **(kg.m-2)** |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.0 | 190.2y | 111.9 | 25.8 | 18.5 | 133.9 | 95.2 | 11.4 | 12.8 | 23.0 a | 1.7 | 10.5 | 13.6 ab |
| 1.1 | 180.2 | 132.6 | 23.6 | 21.7 | 120.2 | 97.9 | 10.1 | 13.2 | 20.8 ab | 3.3 | 7.5 | 14.1 ab |
| 2.2 | 178.8 | 137.7 | 24.7 | 22.7 | 122.2 | 97.0 | 11.0 | 12.6 | 18.9 ab | 1.5 | 7.5 | 13.1 b |
| 4.5 | 180.8 | 144.8 | 23.6 | 22.7 | 114.0 | 110.8 | 9.7 | 14.2 | 14.3 b | 2.8 | 6.3 | 18.4 a |
| **Cover** |  |  |  |  |  |  |  |  |  |  |  |  |
| Bare soil | 196.8 a | 149.8 a | 27.1 a | 24.5 a | 119.5 | 107.3 | 10.6 | 14.4 a | 12.3 b | 2.0 | 7.4 | 16.4 |
| Black plastic | 168.1 b | 113.6 b | 21.7 b | 18.4 b | 125.7 | 93.2 | 10.5 | 12.0 b | 26.1 a | 2.7 | 8.5 | 13.1 |
| **Interaction** |  |  |  |  |  |  |  |  |  |  |  |  |
| B\*C | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| **Regression** |  |  |  |  |  |  |  |  |  |  |  |  |
| Bio Linear | NS | NS | NS | NS | NS | NS | NS | NS | \* | NS | NS | NS |
| Bio Quad | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |

z Sum of three categories of non-marketable fruit: 1) blossom end rot, 2) sun scald, and 3) size, shape, insect damage and other.

y Means within columns with the same letter are not significantly different (least significant difference; P ≤ 0.05). NS = non-significant, \* = P ≤ 0.05, \*\* = P ≤ 0.01

Table 2. Fruit yield of ‘Paladin’ peppers grown in sand based soil. Means are averages of seven harvests. Experimental design was a split plot with four replications, on bare soil or black plastic mulch were the whole plot factors and four levels of biochar (0.0, 1.1, 2.2, and 4.5 kg.m-2) as the sub-plot factors.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Marketable number/ha (thousands)** | **Marketable** **(Mg/ha-1)** | **Total Non-marketablez number/ha (thousands)** | **Total Non-marketable (Mg/ha-1)** | **Blossom End Rot** **number/ha (thousands)** | **Sun Scald number/ha (thousands)** |
|  | **Year** |
|  | **2012** | **2013** | **2012** | **2013** | **2012** | **2013** | **2012** | **2013** | **2012** | **2013** | **2012** | **2013** |
| **Biochar** **(kg.m-2)** |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.0 | 105.6 | 98.9 | 11.3 | 15.5 | 188.3 a | 76.6 b | 12.3 a | 8.7 b | 29.6 | 8.3 | 32.6 ab | 12.0 |
| 1.1 | 87.3 | 98.5 | 9.3 | 15.4 | 185.0 a | 98.8 a | 12.1 ab | 11.1 a | 23.8 | 7.8 | 35.0 a | 17.6 |
| 2.2 | 88.1 | 102.2 | 9.6 | 16.3 | 168.7 ab | 83.1 ab | 11.7 ab | 8.7 b | 21.7 | 8.9 | 21.9 c | 11.9 |
| 4.5 | 91.1 | 102.2 | 9.9 | 16.8 | 156.7 b | 82.3 ab | 10.8 b | 9.5 ab | 24.4 | 8.5 | 24.2 bc | 14.3 |
| **Cover** |  |  |  |  |  |  |  |  |  |  |  |  |
| Bare soil | 103.9 a | 109.7 a | 11.3 a | 17.6 a | 189.7 a | 86.2 | 12.8 a | 10.3 a | 30.4 a | 4.5 b | 34.9 a | 16.6 a |
| Black plastic | 81.5 b | 91.1 b | 8.7 b | 14.4 b | 159.9 b | 84.2 | 10.8 b | 8.7 b | 19.3 b | 12.2 a | 21.9 b | 11.4 b |
| **Interaction** |  |  |  |  |  |  |  |  |  |  |  |  |
| B\*C | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| **Regression** |  |  |  |  |  |  |  |  |  |  |  |  |
| Bio Linear | NS | NS | NS | NS | \*\* | NS | \* | NS | NS | NS | NS | NS |
| Bio Quad | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |

z Sum of three categories of non-marketable fruit: 1) blossom end rot, 2) sun scald, and 3) size, shape, insect damage and other.

y Means within columns with the same letter are not significantly different (least significant difference; P ≤ 0.05). NS = non-significant, \* = P ≤ 0.05, \*\* = P ≤ 0.01

Table 3. Soil nutrients in a Clarion loam 2012. Samples were taken 7-19-2012 (middle) and 10-04-2012 (late). Nitrogen was extracted using a 2N KCl extraction method. Experimental design was a split plot with four replications, bare soil or black plastic mulch (whole plot) and four levels of biochar as (sub plot).

|  |  |  |  |
| --- | --- | --- | --- |
|  | **NH4-N (mg.L-1)** |  | **NO3-N (mg.L-1)** |
|  | **Season** |
|  | **Middle** | **Late** |  | **Middle** | **Late** |
| **Biochar (kg.m**-**2)** |  |  |  |  |  |
| 0.0 | 1.35z | 0.38 |  | 3.11 | 2.08 a |
| 1.1 | 1.47 | 0.38 |  | 2.91 | 1.75 ab |
| 2.2 | 1.35 | 0.36 |  | 2.78 | 1.88 a |
| 4.5 | 1.36 | 0.34 |  | 2.85 | 1.30 b |
| **Cover** |  |  |  |  |  |
| Bare soil | 1.46 a | 0.38 |  | 1.36 b | 1.46 b |
| Black Plastic | 1.31 b | 0.35 |  | 4.46 a | 2.04 a |
| **Interaction** |  |  |  |  |  |
| B X C | NS | NS |  | NS | NS |

z Means within columns with the same letter are not significantly different (least significant difference; P ≤ 0.05). NS = non-significant, \* = P ≤ 0.05, \*\* = P ≤ 0.01

Table 4. Soil nutrients in a Clarion loam 2013. Samples were taken 06-18-2013 (middle) and 11-12-2013 (late). Nitrogen was extracted using a 2N KCl extraction method. Experimental design was a split plot with four replications, bare soil or black plastic mulch (whole plot) and four levels of biochar as (sub plot).

|  |  |  |  |
| --- | --- | --- | --- |
|  | **NH4-N (mg.L-1)** |  | **NO3-N (mg.L-1)** |
|  | **Season** |
|  | **Middle** | **Late** |  | **Middle** | **Late** |
| **Biochar (kg.m**-**2)** |  |  |  |  |  |
| 0.0 | 4.89 abz | 1.65 |  | 7.08 | 2.10 |
| 1.1 | 5.09 ab | 1.48 |  | 6.98 | 1.60 |
| 2.2 | 4.80 b | 1.55 |  | 7.66 | 2.34 |
| 4.5 | 5.74 a | 1.51 |  | 8.42 | 1.43 |
| **Cover** |  |  |  |  |  |
| Bare soil | 6.67 a | 1.65 a |  | 7.76 | 1.26 b |
| Black Plastic | 3.59 b | 1.44 b |  | 7.31 | 2.46 a |
| **Interaction** |  |  |  |  |  |
| B X C | \* | NS |  | NS | NS |

z Means within columns with the same letter are not significantly different (least significant difference; P ≤ 0.05). NS = non-significant, \* = P ≤ 0.05, \*\* = P ≤ 0.01

Table 5. Soil nutrients in a sand based soil 2012. Samples were taken 7-19-2012 (middle) and 10-04-2012 (late). Nitrogen was extracted using a 2N KCl extraction method. Experimental design was a split plot with four replications, bare soil or black plastic mulch (whole plot) and four levels of biochar as (sub plot).

|  |  |  |  |
| --- | --- | --- | --- |
|  | **NH4-N (mg.L-1)** |  | **NO3-N (mg.L-1)** |
|  | **Season** |
|  | **Middle** | **Late** |  | **Middle** | **Late** |
| **Biochar (kg.m**-**2)** |  |  |  |  |  |
| 0.0 | 0.19z | 0.16 |  | 2.27 a | 2.23 a |
| 1.1 | 0.14 | 0.17 |  | 1.66 b | 1.58 b |
| 2.2 | 0.14 | 0.22 |  | 1.32 bc | 1.48 bc |
| 4.5 | 0.14 | 0.16 |  | 1.15 c | 0.95 c |
| **Cover** |  |  |  |  |  |
| Bare soil | 0.16 | 0.20 |  | 1.78 a | 1.46 |
| Black Plastic | 0.15 | 0.15 |  | 1.42 b | 1.66  |
| **Interaction** |  |  |  |  |  |
| B X C | NS | NS |  | NS | NS |

z Means within columns with the same letter are not significantly different (least significant difference; P ≤ 0.05). NS = non-significant, \* = P ≤ 0.05, \*\* = P ≤ 0.01, \*\*\* = P ≤ 0.001

Table 6. Soil nutrients in a sand based soil 2013. Samples were taken 06-18-2013 (middle) and 11-12-2013 (late). Nitrogen was extracted using a 2N KCl extraction method. Experimental design was a split plot with four replications, bare soil or black plastic mulch (whole plot) and four levels of biochar as (sub plot).

|  |  |  |  |
| --- | --- | --- | --- |
|  | **NH4-N (mg.L-1)** |  | **NO3-N (mg.L-1)** |
|  | **Season** |
|  | **Middle** | **Late** |  | **Middle** | **Late** |
| **Biochar (kg.m**-**2)** |  |  |  |  |  |
| 0.0 | 4.65z | 0.54 |  | 4.78 | 2.87 |
| 1.1 | 3.97 | 0.45 |  | 3.86 | 2.08 |
| 2.2 | 4.04 | 0.56 |  | 5.58 | 2.42 |
| 4.5 | 4.83 | 0.46 |  | 4.35 | 2.39 |
| **Cover** |  |  |  |  |  |
| Bare soil | 4.11 | 0.32 b |  | 3.55 b | 0.59 b |
| Black Plastic | 4.63 | 0.68 a |  | 5.64 a | 4.29 a |
| **Interaction** |  |  |  |  |  |
| B X C | NS | NS |  | NS | NS |

z Means within columns with the same letter are not significantly different (least significant difference; P ≤ 0.05). NS = non-significant, \* = P ≤ 0.05, \*\* = P ≤ 0.01