Table 10. Effect of pH on nutrient availability and productivity of onions grown on muck soils in Western New York, field survey, 2010: Mid-season leaf tissue nutrient analysis.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Mid-season plant tissue nutrient analysis - collected July 15 (Panek) & 28 (all others)**  ***In order of increasing soil pH:*** | | | | | | | | | | | | | | |
| **Field\*** | **pH** | **% OM** | **%N** | **ppm** | | | | | | | | | | |
| **P** | **K** | | **Ca** | **Mg** | **Mn** | **Al** | **Fe** | **Zn** | **B** | **Cu** |
| ***Below optimum pH (<5.2):*** | | | | | | | | | | | | |  |  |
| **Mort B** | 4.8 e | 46 cd | 2.9 | 3,343 c | 12,035 de | | 36,670 | 1,982 bcd | 137 a | 21 | 47 bc | 26 bcde | 19 ef | 3.5 c |
| **Mort A** | 5.0 e | 42 d | 2.6 | 2,523 d | 10,974 e | | 29,362 | 2,102 abc | 96 b | 23 | 54 ab | 30 abc | 17 f | 4.3 bc |
| ***Optimum pH (5.2 – 5.8):*** | | | | | | | | | | | | |  |  |
| **Panek A** | 5.3 de | 51 bc | 2.9 | 4,619 b | 14,255 cd | | 32,950 | 1,920 cd | 68 bc | 16 | 52 b | 24 cdef | 33 a | 5.9 a |
| **Panek B** | 5.3 de | 57 a | 2.8 | 4,951 b | 12,291 de | | 32,075 | 1,699 d | 58 cd | 10 | 37 bc | 29 bcd | 26 cd | 4.7 abc |
| **LS 1 A** | 5.3 cde | 53 ab | 2.8 | 3,621 c | 14,314 cd | | 30,045 | 1,962 cd | 64 bc | 22 | 41 bc | 23 def | 32 ab | 5.0 ab |
| **LS 2 A** | 5.6 cd | 50 bc | 2.9 | 3,757 c | 15,542 abc | | 30,047 | 2,316 ab | 52 cd | 14 | 75 a | 22 ef | 33 a | 5.3 ab |
| **LS 2 B** | 5.8 bcd | 51 bc | 2.9 | 3,216 cd | 15,340 bc | | 30,117 | 2,437 a | 43 cd | 11 | 36 bc | 20 f | 34 a | 5.5 ab |
| ***Above optimum pH (>5.8):*** | | | | | | | | | | | | |  |  |
| **Star A** | 5.9 bc | 53 ab | 3.1 | 6,224 a | 18,040 ab | | 32,594 | 2,261 abc | 67 bc | 24 | 46 bc | 35 a | 28 bc | 5.3 ab |
| **LS 1 B** | 6.2 ab | 19 e | 3.0 | 3,084 cd | 10,783 e | | 29,760 | 1,960 cd | 28 d | 9 | 27 c | 19 f | 18 f | 5.5 ab |
| **Star B** | 6.5 a | 51 bc | 3.0 | 3,714 c | 18,154 a | | 31,366 | 2,089 bc | 52 cd | 12 | 27 c | 30 ab | 23 de | 4.8 abc |
| ***P Value (α=0.05)*** | ***0.0001*** | ***0.0000*** | ***NS*** | ***0.0000*** | ***0.0001*** | | ***NS*** | ***0.0120*** | ***0.0005*** | ***NS*** | ***0.0071*** | ***0.0005*** | ***0.0000*** | ***0.0435*** |
| ***Pearson correlation with nutrient level in the soil and leaf tissue nutrient concentration:*** | | | | | | | | | | | | | | |
| **Pearson Correlation** | | | 0.4276 | 0.3244 | 0.8218 | 0.0668 | | 0.5964 | 0.8394 | 0.3774 | 0.1962 | -0.1012 | ~ | ~ |
| ***P Value (α=0.5)*** | | | ***0.0184*** | ***NS*** | ***0.0000*** | ***NS*** | | ***0.0005*** | ***0.0000*** | ***0.0398*** | ***NS*** | ***NS*** | ***~*** | ***~*** |
| ***Pearson correlation with soil pH and leaf tissue nutrient concentration:*** | | | | | | | | | | | | | | |
| **Pearson Correlation** | | | 0.4798 | 0.0523 | 0.4096 | -0.2482 | | 0.3018 | -0.7020 | -0.2565 | -0.3199 | -0.971 | -0.0066 | 0.4600 |
| ***P Value (α=0.5)*** | | | ***0.0073*** | ***NS*** | ***0.0246*** | ***NS*** | | ***NS*** | ***0.0000*** | ***NS*** | ***NS*** | ***NS*** | ***NS*** | ***0.0105*** |
| ***Pearson correlation with % OM and leaf tissue nutrient concentration:*** | | | | | | | | | | | | | | |
| **Pearson Correlation** | | | -0.0972 | 0.4689 | 0.4896 | 0.1407 | | -0.0057 | 0.2551 | 0.0557 | 0.1783 | 0.4018 | 0.5496 | -0.1469 |
| ***P Value (α=0.5)*** | | | ***NS*** | ***0.0090*** | ***0.0060*** | ***NS*** | | ***NS*** | ***NS*** | ***NS*** | ***NS*** | ***0.0277*** | ***0.0017*** | ***NS*** |

\*Within each field, an area was selected for each low (A) and high (B) pH. Three sub-samples were set up in each area A and B.