Supplementary Material Table S1. Correlation between soil properties and mineral composition of cocoyam cormels (pooled data of 2017 and 2018

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | N | P | K | Ca | Mg | Cu | Zn | Fe |
| Bulk | -0.848\*\* | -0.765\* | -0.884\*\* | -0.819\* | -0.902\*\* | -0.809\* | -0.847\*\* | -0.840\*\* |
| Density | (0.008) | (0.027) | (0.004) | (0.013) | (0.002) | (0.015) | (0.008) | (0.009) |
| Total | 0.849\*\* | 0.766\* | 0.885\*\* | 0.819\* | 0.903\*\* | 0.810\* | 0.847\*\* | 0.841\*\* |
| porosity | (0.008) | (0.027) | (0.004) | (0.013) | (0.002) | (0.015) | (0.008) | (0.009) |
| Moisture | 0.813\* | 0.656 | 0.857\*\* | 0.765\* | 0.858\*\* | 0.758 | 0.809\* | 0.792\* |
| Content | (0.014) | (0.077) | (0.007) | (0.027) | (0.006) | (0.29) | (0.015) | (0.019) |
| Ph | 0.656 | 0.500 | 0.549 | 0.567 | 0.613 | 0.686 | 0.649 | 0.624 |
|  | (0.078) | (0.207) | (0.132) | (0.142) | (0.074) | (0.061) | (0.082) | (0.098) |
| Organic | 0.912\*\* | 0.879\*\* | 0.974\*\* | 0.813\* | 0.986\*\* | 0.952\*\* | 0.923\*\* | 0.896\*\* |
| Carbon | (0.002) | (0.004) | (0.000) | (0.014) | (0.000) | (0.000) | (0.001) | (0.003) |
| N | 0.960\*\* | 0.932\*\* | 0.943\*\* | 0.865\*\* | 0.974\*\* | 0.993\*\* | 0.942\*\* | 0.944\*\* |
|  | (0.000) | (0.001) | (0.000) | (0.006) | (0.000) | (0.000) | (0.000) | (0.000) |
| P | 0.975\*\* | 0.913\*\* | 0.969\*\* | 0.940\*\* | 0.899\*\* | 0.908\*\* | 0.999\*\* | 0.974\*\* |
|  | (0.000) | (0.002) | (0.000) | (0.001) | (0.002) | (0.002) | (0.000) | (0.000) |
| K | 0.797\* | 0.674 | 0.845\* | 0.696 | 0.881\*\* | 0.794\* | 0.766\* | 0.763\* |
|  | (0.018) | (.067) | (0.008) | (0.055) | (0.004) | (0.019) | (0.027) | (0.028) |
| Ca | 0.891\*\* | 0.805\* | 0916\*\* | 0.830\* | 0.927\*\* | 0.861\*\* | 0.866\*\* | 0.878\*\* |
|  | (0.003) | (0.016) | (0.001) | (0.011) | (0.001) | (0.006) | (0.005) | (0.004) |
| Mg | 0.857\*\* | 0.756\* | 0.936\*\* | 0.777\* | 0.928\*\* | 0.838\*\* | 0.864\*\* | 0.834\*\* |
|  | (0.007) | (0.030) | (0.001) | (0.023) | (0.001) | (0.009) | (0.006) | (0.010) |

\*\*Correlation is significant at the level of 0.01 (2-tailed)

\*Correlation is significant at the level of 0.05 (2-tailed)

Supplementary Material Table S2. Correlation between soil properties and growth and yield of cocoyam (pooled data of 2017 and 2018

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Plant height | Number of leaves | Leaf area | Corm yield | Cormel yield |
| Bulk | -0.894\*\* | -0.840\*\* | -0.889\*\* | -0.864\*\* | -0.864\*\* |
| density | (0.003) | (0.009) | (0.002) | (0.006) | (0.006) |
| Total | 0.895\*\* | 0.841\*\* | 0.841\*\* | 0.864\* | 0.864\* |
| porosity | (0.003) | (0.009) | (0.009) | (0.000) | (0.000) |
| Moisture | 0.855\*\* | 0.804\* | 0.848\*\* | 0.811\* | 0.811\* |
| content | (0.007) | (0.016) | (0..008) | (0.015) | (0.015) |
| pH | 0.753\* | 0.804\* | 0.749\* | 0.686 | 0.686 |
|  | (0.031) | (0.016) | (0.032) | (0.060) | (0.060) |
| Organic | 0.974\*\* | 0.981\*\* | 0.965\*\* | 0.956\*\* | 0.956\*\* |
| carbon | (0.000) | (0.000) | (0.000) | (0.000 | (0.000 |
| N | 0.988\*\* | 0.946\*\* | 0.995\*\* | 0.990\*\* | 0.990\*\* |
|  | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| P | 0.957\*\* | 0.828\* | 0.944\*\* | 0.973\*\* | 0.973\*\* |
|  | (0.000) | (0.011) | (0.000) | (0.000) | (0.000) |
| K | 0.863\*\* | 0.875\*\* | 0.858\*\* | 0.807\* | 0.807\* |
|  | (0.000) | (0.004) | (0.006) | (0.015) | (0.015) |
| Ca | 0.937\*\* | 0.903\*\* | 0.929\*\* | 0.898\*\* | 0.898\*\* |
|  | (0.001) | (0.002) | (0.001) | (0.002) | (0.002) |
| Mg | 0.917\*\* | 0.910\*\* | 0.901\*\* | 0.875\*\* | 0.875\*\* |
|  | (0.001) | (0.002) | (0.002) | (0.004) | (0.004) |

\*\*Correlation is significant at the level of 0.01 (2-tailed)

\*Correlation is significant at the level of 0.05 (2-tailed)