**Supplementary materials**

**Table captions:**

Table S1 Nitrogen and phosphorus nutrient demands to reach 100 kg in crop yields

Table S2 Total nitrogen content of cultivated land in 11 municipal districts

Table S3 Recommended value of fertilizer supply ratio for different nitrogen and phosphorus levels

Table S4 Available phosphorus content of cultivated soil

Table S5 Excretion coefficient of livestock and poultry breeding

**Table S1 Nitrogen and phosphorus nutrient demands to reach 100 kg in crop yields**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Nitrogen** | **Phosphorus** | **Name** | **Nitrogen** | **Phosphorus** |
| **(kg)** | **(kg)** | **(kg)** | **(kg)** |
| Rice | 2.20 | 0.80 | Tobacco | 3.85 | 0.53 |
| Wheat | 3.00 | 1.00 | Vegetables | 0.36 | 0.088 |
| Corn | 2.30 | 0.30 | Watermelon | 0.80 | 0.33 |
| Millet | 3.80 | 0.44 | Melon | 0.30 | 0.15 |
| Beans | 7.20 | 0.75 | Strawberry | 0.35 | 0.17 |
| Potato | 0.50 | 0.088 | Tea | 6.40 | 0.88 |
| Oil crop | 7.19 | 0.88 | Citrus | 0.60 | 0.11 |
| Cotton | 11.70 | 3.04 | Pear | 0.47 | 0.23 |
| Cane | 0.18 | 0.016 | Grape | 0.74 | 0.51 |

**Table S2 Total nitrogen content of cultivated land in 11 municipal districts**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| City | Number of samples | Maximum  (g·kg-1) | Minimum  (g·kg-1) | Mean  (g·kg-1) | SD  (g·kg-1) | CV  （%) |
| Fuzhou | 1714 | 3.43 | 0.36 | 1.69 | 0.0484 | 28.66 |
| Ganzhou | 2920 | 3.52 | 0.33 | 1.47 | 0.0474 | 32.32 |
| Ji'an | 2408 | 3.06 | 0.47 | 1.58 | 0.0418 | 26.43 |
| Jingdezhen | 495 | 3.3 | 0.56 | 1.67 | 0.0423 | 25.29 |
| Jiujiang | 1600 | 3.14 | 0.26 | 1.22 | 0.0454 | 37.34 |
| Nanchang | 1267 | 3.18 | 0.42 | 1.75 | 0.0476 | 27.22 |
| Pingxiang | 508 | 3.42 | 0.55 | 1.91 | 0.0519 | 27.2 |
| Shangrao | 2389 | 3.32 | 0.36 | 1.6 | 0.0458 | 28.64 |
| Xinyu | 443 | 3.57 | 0.46 | 1.99 | 0.0551 | 27.66 |
| Yichun | 1928 | 3.21 | 0.35 | 1.65 | 0.0461 | 27.89 |
| Yingtan | 523 | 2.78 | 0.37 | 1.61 | 0.0476 | 29.69 |

**Table S3 Recommended value of fertilizer supply ratio for different nitrogen and phosphorus levels**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Soil nitrogen and phosphorus nutrient classification | | I | II | III |
| Percentage of fertilization supply | | 35% | 45% | 55% |
| Total nitrogen content（g·kg-1） | Field crops | >1.0 | 0.8~1.0 | <0.8 |
| Paddy field | >1.2 | 1.0~1.2 | <1.0 |
| Vegetable field | >1.2 | 1.0~1.2 | <1.0 |
| Orchard | >1.0 | 0.8~1.0 | <0.8 |
| Soil available phosphorus content（mg·kg-1） | | >40 | 20~40 | <20 |

**Table S4 Available phosphorus content of cultivated soil**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Content range (mg·kg-1)  Percentage of fertilization supply | I | II | III | Sum |
| >40 | 20~40 | 10~20 |  |
| 35% | 45% | 55% |  |
| Fuzhou | 0.18 | 0.61 | 0.21 | 45.34% |
| Ganzhou | 0.15 | 0.45 | 0.39 | 47.40% |
| Ji'an | 0.10 | 0.40 | 0.50 | 49.00% |
| Jingdezhen | 0.49 | 0.39 | 0.12 | 41.23% |
| Jiujiang | 0.00 | 0.39 | 0.61 | 51.14% |
| Nanchang | 0.08 | 0.74 | 0.18 | 45.99% |
| Pingxiang | 0.07 | 0.45 | 0.47 | 48.99% |
| Shangrao | 0.05 | 0.31 | 0.64 | 50.91% |
| Xinyu | 0.00 | 0.08 | 0.92 | 54.16% |
| Yichun | 0.01 | 0.64 | 0.35 | 48.44% |
| Yingtan | 0.00 | 0.47 | 0.53 | 50.30% |
| Average percentage of phosphorus supplied through fertilization | | | | 48.45% |

**Table S5 Excretion coefficient of livestock and poultry breeding**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Species | Nitrogen kg/(ca·a) | | | Phosphorus kg/(ca·a) | | |
|  | Manure | Urine | Sum | Manure | Urine | Sum |
| Cattle | 31.909 | 24.893 | 56.802 | 24.93 | 1.494 | 26.424 |
| Pig | 6.132 | 3.285 | 9.417 | 4.38 | 1.341 | 5.721 |
| Sheep | —— | —— | 5.694 | —— | —— | 2.847 |
| Poultry | —— | —— | 0.548 | —— | —— | 0.365 |