Table 1. Assigning values and scores to three scenarios of soil quality indicators.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Indicator | Value and corresponding score (in parenthesis) | | | |
|  | **Best** | **Good** | **Poor** | **Remark** |
| OM, % | 3.5-5 (25) | 2.5-3.5 (20) | <2 (15) |  |
| Physical properties |  |  |  |  |
| Water stable aggregation, % | >80 (6) | 60-80 (4) | 50-60 (2) |  |
| Bulk density (BD), oz/in3 | <0.64, <0.81, <0.92 (6) | 0.64<BD<0.75,0.81<BD<0.92, &0.92<BD<0.98 (3) | >0.81, >0.92, >0.98 (1) | Clayey, silty, & sandy soil, respectively |
| Infiltration rate, in/hr | 0.4-2.0, 0.08-1.0, & 0.01-0.1 (4) | ± 0.2 of best value (3) | ± 0.4 of best value (2) | Sandy/silt, loam, & clayey, respectively |
| Chemical properties |  |  |  |  |
| pH | 5.8-7.3 (9) | 5.0-5.7, 7.3-8.0 (6) | <5, > 8 (3) |  |
| Fertility ( N, P and K), | N-100% of yield goal  P&K- 100% sufficient (6) | N-80% of yield goal  P&K- 80% sufficient (4) | N-< 80% of yield goal  P&K- < 80% sufficient (2) | Based on recommended rate for specific field and crop |
| EC, dS/m | <0.98 (5) | 0.98 - 1.71 (3) | >1.71 (1) | Varies with crop |
| Soil Biological Properties |  |  |  |  |
| Soil respiration, lbs CO2-C/a/d | 32-64 (9) | 16-32 (7) | <16, >64 (4) | 4 in top soil |
| Earth worm, #/ft2 in holes | > 15 (7) | 5-15 (5) | <5 (3) | Population is limited by resource availability |

**Table 2. Total soil quality score and corresponding general recommendation.**

|  |  |  |
| --- | --- | --- |
| Total score | Intervention type | Description |
| >90 | Minor new intervention; continue with maintenance to avoid degradation | Look for the indicator with lowest score and intervene with appropriate remediation practices |
| 80-90 | Moderate intervention | Look for the indicator with lowest score for each component and intervene with appropriate remediation practices. |
| <80 | Major and immediate intervention is required | Investigate the score of indicators in each component and apply comprehensive best management practices. This level of soil quality warrants the need for raising soil organic matter level. |

Table 3. Comparison of total and individual soil quality components for farms with total score less than <90 (n= 53).

|  |  |  |  |
| --- | --- | --- | --- |
| Soil quality component | Conventional | Low Input | Organic |
| Total | 72.5 a | 64.5 c | 76.3 a |
| Biological properties | 14.5 a | 14.2 a | 14.3 a |
| Physical properties | 15.4 a | 12.1 b | 16.4 a |
| Chemical | 24.5 a | 23.2 a | 24.1 a |
| Organic matter | 17.3 b | 15.0 c | 21.2 a |

Across row for each component, soil quality index values followed by the same letter were not significantly different at P ≤ 0.05 based on Fisher’s Least Significant Difference (LSD) test.