The luanzhu city in hebei province soil fertility quality evaluation

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Abstract: This research work in the quality evaluation of soil fertility and soil testing formula, on the basis of continue to enlarge the area of soil soil test and sample points, get more soil nutrient material, based on the test results, combined with previous data, the system analysis to the state of the luanzhou city in hebei province the current situation of the agricultural land soil fertility quality.

1. Material method

1.1. Technical route
Determined by the original data collection, field location points and sample collection, processing and measuring, data processing and statistical analysis, under the guidance of scientific theory, this paper compares and analyzes reveal the luanzhou city farmland soil fertility quality of city space variation and time variation law; to establish regional cultivated land fertility evaluation index system and evaluation model, evaluate the state of the luanhe river cultivated land fertility.

1.2. Research method and content

1.2.1. The cultivated land fertility evaluation method
Evaluation method is divided into single factor index method and comprehensive index method. Single factor evaluation model using the fuzzy evaluation method, analytic hierarchy process (ahp) and comprehensive index evaluation model with the clustering analysis method, the accumulative model method, etc.

1.2.2. Determine the location of the method and sampling method

1.2.2.1. Determine the location of the method
In accordance with the requirements for the sampling, and the average representative at each sampling area of 200 mu, determine the number of sampling points total in 4000. Field investigation, on the basis of the present situation of land use map, investigating various crop fertilizer levels, output levels, economic benefits, etc. The soil map, administrative zoning and land use map overlay, form the
1.2.2.2. sampling method
The field soil sample sample before harvest. Field sampling plots in determining, according to the figure of point to point in the village, the first village to farmers in the agricultural production condition, to determine the representative field, field area demand in more than one mu, based on the field of precise bearing fixed point on the graph point position, and orientation with the GPS locator.

Investigation, sampling, to determine the sampling plots householder, item by item according to the survey form the content of the survey to fill out. In the field according to the situation in 0 ~ 20 cm soil sampling; Adopted the "S" method, the uniform random sampling points, 15 after fully mixing, quartering to return 1 kg. Sampling tools with a wooden and bamboo blade, plastic shovel, stainless steel auger, etc; A bag of soil sample to fill in two labels, each has its inside and outside. Main content label are as follows: the sample field number, sampling depth, sampling location, sampling time, sampling, etc.

1.2.2.3. survey content
At the same time of sampling, to sample the site conditions, soil properties, farmland infrastructure conditions, cultivation management and pollution situation of detailed investigation.

1.2.2.4. analysis program and the method
The determination of organic matter by potassium dichromate method of an oil bath - sulfuric acid solution; Effectiveness of soil on the determination of copper, zinc, iron, manganese by DTPA extraction, atomic absorption spectrometry; The determination of total nitrogen using semi-micro kelvin method; The determination of the effective phosphorus by sodium bicarbonate, the molybdenum antimony against colorimetric method; The determination of rapidly-available potassium by ammonium acetate extraction - flame photometry.

2. The results analysis

2.1. Soil organic matter
The average content of 17.14 g/kg, a maximum of 61.429 g/kg, the minimum value is 3.71 g/kg; Cultivated land in the city of soil organic matter content is between 1 to 6, one of the most was a category four, covers an area of 549159.3 mu, accounting for 68.13391% of the total area; The least for level 6, covers an area of 5530.8 mu, accounting for 0.6862096% of the total area, no secondary.

2.2. Total nitrogen in soil
The average content of 0.72 g/kg, a maximum of 36.83 g/kg, the minimum value is 0.19 g/kg; The farmland soil total nitrogen content in the city between 1 to 6, one of the most for grade 5, covers an area of 312733.9 mu, accounting for 38.80072% of the total area; The least for level 1, covers an area of 7377.3 mu, accounting for 0.9152995% of the total area, no secondary.

2.3. The available soil phosphorus
The average content of 32.24 mg/kg, a maximum of 87.26 mg/kg, the minimum value of 8.23 mg/kg; Cultivated land in the city of soil effective phosphorus content between one to four, one of the most for the secondary, covers an area of 456662.6 mu, accounting for 56.65796% of the total area; The least for level 4, covers an area of 7377.3 mu, accounting for 0.9152995% of the total area, no secondary.

2.4. Soil available potassium
The average content of 149.78 mg/kg, a maximum of 382.69 mg/kg, the minimum value of 30.20 mg/kg; Farmland soil available k content in the city between one to five, one of the most was a category four, covers an area of 343779.6 mu, accounting for 42.65254% of the total area; At least for five, covers an
area of 9784.1 mu, accounting for 1.213909% of the total area, there is no 6.

2.5. Soil effective copper
The average content of 0.97 mg/kg, a maximum of 4.45 mg/kg, the minimum value of 0.21 mg/kg; Cultivated land in the city of soil effective copper content between 1 to 3, one of the most for level 3, covers an area of 499285.4 mu, accounting for 61.94608% of the total area; The least for level 1, covers an area of 21848.4 mu, accounting for 2.71072% of the total area.

2.6. Available soil iron
The average content of 74.07 mg/kg, a maximum of 148.80 mg/kg, the minimum value of 6.69 mg/kg; Cultivated land in the city of soil effective iron content between one to five, one of the most for level 1, covers an area of 654279.2 mu, accounting for 81.17612% of the total area; At least for five, covers an area of 12.1 mu, accounting for 0.001505902% of the total area.

2.7. The soil effective manganese
The average content of 21.85 mg/kg, a maximum of 34.58 mg/kg, the minimum value of 3.48 mg/kg; Cultivated land in the city of soil effective manganese content between one to four, one of the most for the secondary, covers an area of 413115.5 mu, accounting for 51.25502% of the total area; The least for level 4, covers an area of 9736.8 mu, accounting for 1.208038% of the total area.

2.8. Soil zinc effectively
The average content of 3.19 mg/kg, a maximum of 12.21 mg/kg, the minimum value of 0.75 mg/kg; Cultivated land in the city of soil effective zinc content between 1 to 3, one of the most for the secondary, covers an area of 429105.6 mu, accounting for 53.23891% of the total area; With a minimum of level 3, the area of 4539.8 mu, accounting for 0.563252% of the total area.

3. Conclusion
Will be subject to city cultivated land area of 849232.05 acres of the luanhe river, will all the cultivated land in the city is divided into four levels: the level of 99971.86 acres, 11.77% of the total area of arable land, secondary land 372967.85 mu, 43.92% of the total area of arable land, level 3 257727.67 acres, 30.35% of the total area of arable land, level 4 118564.67 acres, 13.96% of the total area of arable land.

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