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Institute of Horticulture

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Agrochemical laboratory

Certificate of Technical Competence No 04-2016 of 26.09.2016

Sample: humic product
Testing ordered by: A-Rise Co., Ltd., <http://arisestimulador.com/>
Amount of sample provided for testing: 1.1 kg
Test dates: 10-17 May 2017
Sample receipt date: 10 May 2017
Purpose of test: determining chemical composition

Test Protocol No 45

| No | Indicator | Value | Designation of test method |
|--------------------------------------|---|-------|---|
| 1 | 2 | 3 | 4 |
| General properties | | | |
| 1 | Potential of hydrogen, pH (1:10) | 7.02 | DSTU ISO 10390:2001 Agricultural Chemistry Practicum / Under the editorship of V.G. Mineev – Moscow: Moscow University Publishing House, 2001 – 688 p. |
| 2 | Electrical conductivity, mSm (1:10) | 0.55 | |
| 3 | Water-soluble phosphorus content, % | 0.08 | |
| 4 | Water-soluble potassium content, % | 0.06 | |
| 5 | Water-soluble nitrate nitrogen content, % | 0 | |
| 6 | Water-soluble ammonia nitrogen content, % | 0.22 | |
| 7 | Water-soluble mineral nitrogen content, % | 0.22 | |
| 8 | Content of total (general) forms of nitrogen, % | 5.34 | |
| 9 | Content of total forms of phosphorus, % | 0.19 | |
| 10 | Content of total forms of potassium, % | 0.34 | |
| 11 | Bulk weight, g/cm ³ | 0.98 | |
| Composition of organic matter | | | |
| 14 | Moisture content, % | 81.7 | DSTU ISO 11465:2001 |
| 15 | Dry matter content, % | 18.3 | |
| 16 | Ash content, % | 20.0 | GOST 26714-85 |
| 17 | Organic matter content, % of dry matter | 80.0 | GOST 27980-88 |
| 18 | Content of organic matter carbon, % of dry matter | 40.0 | |
| 19 | Total content of humus acids, % of absolute dry organic matter, | 58.4 | DSTU 7083:2009 |
| 20 | including: humic acids | 43.8 | |
| 21 | fulvic acids | 14.6 | |
| Toxicological indicators | | | |
| 22 | Sum of salts, g/100 g | 0.36 | GOST 27894.9-88 |
| 23 | CO ₃ ⁻ ion content, mg-equiv/100 g | 0 | |
| 24 | HCO ₃ ⁻ ion content, mg-equiv/100 g | 0.42 | |
| 25 | Cl ⁻ ion content, mg-equiv/100 g | 0.17 | GOST 27894.8-88 |
| 26 | SO ₄ ²⁻ ion content, mg-equiv/100 g | 4.76 | GOST 27894.9-88 |
| 27 | Ca ²⁺ ion content, mg-equiv/100 g | 4.44 | GOST 27894.10-88 |
| 28 | Mg ²⁺ ion content, mg-equiv/100 g | 0.85 | |
| 29 | Na ⁺ ion content, mg-equiv/100 g | 0.03 | GOST 27753.12-88 |

| | | | |
|----|--|------|--|
| 30 | K ⁺ ion content, mg-equiv/100 g | 0.03 | |
| 31 | Content of toxic alkali salts, mg-equiv/100 g | 0 | Agricultural Chemistry Practicum / Under the editorship of V.G. Mineev – Moscow, 2001 – 688 p. |
| 32 | Content of toxic neutral salts, mg-equiv/100 g | 0.91 | |
| 33 | Content of nontoxic salts, mg-equiv/100 g | 4.44 | |
| 34 | Content of active forms of zinc, mg/kg | 2.3 | |
| 35 | Content of active forms of iron, mg/kg | 5.9 | DSTU 4770.4:2007 |
| 36 | Content of active forms of cobalt, mg/kg | 0.44 | DSTU 4770.5:2007 |
| 37 | Content of active forms of manganese, mg/kg | 12.2 | DSTU 4770.1:2007 |
| 38 | Content of active forms of copper, mg/kg | 5.0 | DSTU 4770.6:2007 |

Conclusion: in terms of chemical composition, the analyzed product corresponds to a concentrated organic-mineral fertilizer, because it contains a substantial quantity of organic matter plus mineral compounds of main nutrient macro- and microelements.

Properties: this fertilizer represents a concentrated humic product, because the most part of its organic matter consists of humus acids (58.4%), the major part of which is composed of highly-valuable humic acids (43.8%) and active fulvic acids (14.6%).

The fertilizer also contains a substantial quantity of NPK in water-soluble and organic forms, and a certain quantity of microelements, which increase its fertilizing value.

The fertilizer is characterized by favorable reaction of the medium, because both in concentrated and in diluted form, pH is close to neutral, which is preferable for most crops.

The total salt content of aqueous extract is low, which is also corroborated by electrical conductivity results. The content of chlorides is not high, which allows this fertilizer to be used in growing of chlorine-sensitive crops.

No highly-toxic alkali salts have been found in the sample fertilizer, which is good for all cultures grown in open and closed soil. The content of toxic neutral salts, dangerous only in high concentrations, is low.

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Round stamp of M.F. Sydorenko Melitopol Gardening Research Station