

ESTABLISHMENT AND ECOLOGICAL-AND-ECONOMIC EVALUATION THE INVESTMENT PROJECT OF PROCESSING POULTRY MANURE TO PEAT COMPOST

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The purpose of the Investment Project (on commercial basis) is transferring innovative technology for organic waste management by developing an engineering project for the processing of chicken (bird) manure to high-quality peat compost [1].

The use of high-quality composts, including peat compost, which will have ameliorative influence to soil restoration, consider as a strategic direction for reducing the deficit of humus in the soil balance of agrarian enterprises and in whole agriculture in Ukraine. At the same time, it'll increase economic availability for agricultural enterprises to buy them in the market of organic fertilizers and increase the receipt of high-quality organic fertilizers. The cost production of high-quality peat compost is significantly lower than known species that are common in the market of organic fertilizers, in particular vermicompost (biohumus) [2].

However, it's calculated that the approximate cost of producing 1 ton of biohumus is 30,61 USD (854,22 UAH), while the production of peat compost from chicken manure is only 15,13 USD (422,25 UAH). It should be noted that the cost of biohumus is calculated under the condition of an exclusive one

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direction of production (biohumus itself) and without taking into account of spend to scattering it into the fields, that's, for wholesale trade [2; 3]. Moreover, with this variant the cost between peat compost and biohumus is two time different in favor of the first, and in the case of comparison at market prices, the difference will be even more striking.

The results of researches at the NSC «ISSAR» have been showing that in the processing of chicken (bird) manure on a peat compost to need the mineral additives are added, namely phosphogypsum for binding of easily accessible forms of nitrogen and use of potassium chloride in the conditions of cooling (winter period) in production of high-quality and balanced nutrient composition of organic fertilizers (compost) [4, p. 132].

In the context of soil melioration peat compost should be to use on different by acidity soils. Therefore, priority to use a peat compost in the Kharkiv region for acidic of arable land about 270 thous. hectares, which 4.3 thous. hectares are strongly acid soils (pH KCl <4.6), about 60 thous. hectares – medium acid soils (pH KCl < 4,6-5,0) and about 206 thous. hectares are slightly acid soils [4; 5].

The main (general) directions of economic activity on this project should be:

- selection and evaluation raw for the preparation of peat mixture;
- determination of the need for filler fillers (peat), its quantity and quality, as well as the observance of the initial moisture content of the finished compost mixture;
- balancing mineral additives and fertilizers in raw to improve the nutritional value of the finished compost;
- production a peat compost according to optimal decisions on technical and technological support;
- optimization of compost production technology depending on the scale of the main production of poultry farms (poultry complexes);
- solving technique problems for places to put and enhancement methods of fermentation a composting mixture;
- clarification and technological support of the compost production process at all steps of the project, include sampling and final control quality it;
- certification of quality the finished product;
- realization compost and formulation proposal for determining the rational norm by apply received compost;
- commercial promotion and implementing results of scientific research achieved by NNC «ISSAR» into agrarian industry.

This business idea can be implemented through a common activity or transfer of technology for the production of peat compost, both with establish a legal entity and without its, as on based a poultry farm (poultry complex) or anywhere agricultural enterprise. In the structure its founders, in addition to

the investor (investors), can enter the NSC «ISSAR» which investing intellectual property rights in equity to establish enterprise, that have shown in the tables 1 and 2.

Table 1

**Relevant measures and their implementation timetable
(Project with the average annual quantities of chickens
before 750 thous. heads)**

Name of measures & actions	Time from start-up of funding		Effective Cost, Thous. USD	Expected Results
	Initial Date of Implementing	Final Date of Implementing		
Preparation for establishing	1 quarter	2 quarter	346,3	Receive any permission and final development of design and technical documentation
Organizational cycle	3 quarter	5 quarter		Setting equipment and machines to production activities
Production cycle	6 quarter	6,1 years	372,7 (annually)	Beginning of composting, its fermentation and quality control, scattering at fields or delivery to agricultural producers

Funding Sources (thous. United States Dollars):

- your own and begin investment resources of agricultural enterprise(s), firstly including poultry farms (poultry complexes) and farm's holding (Producer of peat compost / Current assets): 372,7 thous. USD;

- Investor's (Investing at Fixed assets: Property, Plant and Equipment): 346,3 thous. USD;

- Total (amount): 719,0 thous. USD.

Preliminary technical & economic calculations, where includes cost-effectiveness elements:

- Net Present Value (NPV) – 377,4 thous. USD;

- Internal Rate of Return (IRR) – 1,090;

- Payback Period (PP) – 3,7 years.

- Discountable Payback Period (DPP) – 6,1 years.

Cost-effectiveness including added ecological effect in calculations:

- Net Present Value (NPV) – 2251,8 thous. USD;

- Internal Rate of Return (IRR) – 6,501;

- Payback Period (PP) – is very small (insignificant);

- Discountable Payback Period (DPP) – 0,7 years.

Table 2

**Investment expenditures (thous. USD)
(calculations made as on 12 April, 2021 year)**

Title	Cost (Project-estimated cost), thous. USD:	
	on an annual cycle	for 10 thous. tons compost mixture
Buildings and constructions		
Storage (ground) for peat	84,2	28,1
Storage for mineral materials (fertilizers) and / or nutrients (additives)	24,4	8,1
Compost place (trench)	82,3	27,4
Trestlework	6,3	2,1
Total	197,2	65,7
Technical means		
At full (100 %) use	119,3	39,8
At 80 % use	149,1	49,7
Fixed assets (Buildings and constructions, Technical means) – Total		
At full (100 %) use	316,5	105,5
At 80 % use	346,3	115,4

Source: Calculated at official exchange rate of Ukrainian Hryvnia to foreign currency as of April 12, 2021: 27.91 UAH per 1 dollar USD set on by National Bank of Ukraine. Access mode: <https://bank.gov.ua/ua/markets/exchangerate-chart>

Form of investment attracting on the basis of existing poultry farms (poultry complexes) or a separate (individual) agricultural enterprises without creating or creating a new entity. In conclusion it should be said that obtain the results evaluation of the investment project have all the signs of compliance with the requirements, where a separate significant ecological effect its toward on soil resources.

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