



**PLANTFEED**

MINERAL & ORGANIC FERTILIZER

#### THE ECONOMIC EFFICIENCY OF PLANTFEED'S USAGE:

Application of 3 t/ha **PLANTFEED** to potatoes provided 72% profitability and generated net operating profit of 30300 UAH/ha, which exceeded the corresponding figures of the mineral fertilizer system by 3. The figures of fertilizer system based on the half-decayed cattle manure exceeded by 9900 UAH/ha and 54% (by cost-effectiveness).

Aftereffect of 3 t/ha **PLANTFEED** on winter wheat yielded 45% cost-effectiveness and 2200 UAH/ha of net operating profit, which exceeded the figures of the aftereffects of mineral fertilizer system by 14% and 765 UAH/ha by cost-effectiveness and net operating profit. The aftereffect figures of fertilizer system based on the half-decayed cattle manure exceeded by 524 UAH/ha and 10% respectively.

Economic indicators are set at prices: diesel fuel – 21 UAH/kg, potato commercial – 4.5 UAH/kg, wheat grain – 4 UAH/kg.

**PLANTFEED** is a highly concentrated organic fertilizer that is characterized by a low mass but high content of nutrients. Therefore, we take a little (2-3 t/ha), and we get the effect of fertilization equal to 30 t/ha of manure or 1 t/ha of ammonium nitrate phosphate fertilizer.

**PLANTFEED** is an indispensable substrate for the development of soil microorganisms and the source of their food. Soil microorganisms decompose this fertilizer and release more than 90% of nutrients for the plant in a timely manner and in the amount that the plant needs. Therefore, **PLANTFEED** activates the biological soil activity, which provides the desired assortment of field menu of the plant.

**PLANTFEED** contains ready-made growth and development stimulants for plants – humus-like substances, which activate the processes of plant roots formation and vegetative mass increase. These processes provide high yield and plants' resistance to diseases.

After applying **PLANTFEED** in the 1st year, the useful effect lasts for 3 years. Therefore, applying **PLANTFEED** from year to year will increase the soil fertility, because **PLANTFEED** is a heavenly nutrition for microorganisms.

Among microorganisms that develop after applying **PLANTFEED** to the soil, there are microorganisms-nitrogen fixators that are capable of absorbing ground air nitrogen and converting it into fertilizer available to plants. Fixation of air nitrogen by soil microorganisms under proper conditions can reach 30-50 kg/ha for microorganisms of the non-symbiotic group and 90-320 kg/ha for the microorganisms of the symbiotic group – the so-called bulbous bacteria that live in the roots of legume crops.

2 t of **PLANTFEED** are equal to 1 t ammonium nitrate phosphate fertilizer or 30 t of half-decayed cattle manure in its nutritious value. Such calculations are based on the contents of the nutrients in **PLANTFEED** and the named fertilizers and the effect of unproductive losses of mineral fertilizers nutritional elements. Another benefit of **PLANTFEED** usage is stimulation of processes of atmospheric nitrogen fixation by microorganisms, which increase the efficiency of our fertilizer by additional 15-25%.

Tabl. 1. Basic indices of the **PLANTFEED** chemical composition

Index	Unit of measure	Фактическое значение	
		Without mineral additive (PF)	With mineral additive (PFz)*
pH	pH unit	7,2-7,7	7,0-7,6
Humidity	%	6-10	12-15
Dry substance	%	90-94	85-89
Ash	% per dry substance	53-60	30-35
Organic substance		35-50	45-68
Common nitrogen		2,0-4,0	3,0-4,1
Common phosphorus		2,0-3,8	2,1-2,8
Common potassium		1,9-2,2	2,2-3,1

Note:  
\* Modification of the fertilizer with mineral additive (PFz) contains natural minerals – zeolites, which create an additional ability of fertilizer to retain moisture in the soil, which increases endurance of plants in conditions of drought.

Tabl. 2. Content of microelements \*\* in **PLANTFEED** fertilizer (PFz...PF)

Element	Ferrum Fe	Cobalt Co	Cuprum Cu	Manganium Mn	Nickel Ni	Zinc Zn
Content, mg / kg	1100-1220	12-19	37-44	400-470	20-38	250-450

Note:  
\*\* Microelements play a vital role in the development of plants, because they are a part of enzymes and vitamins, and therefore regulate the processes of photosynthesis, protein and vitamin synthesis and insure an intensive and balanced plant development.

#### PLANTFEED FIELD STUDY RESULTS

The research was carried out on soddy cryptopodzolic soils under conditions of field experiment. Location: Rivne region, Kostopil district, Mala Lyubasha village (the experiment was founded by the scientists of NUWEE – National University of Water and Environmental Engineering).

Tabl. 3. Scheme of field experiment on the study of **PLANTFEED** effectiveness in contrast to mineral fertilizers and half-decayed cattle manure

Experiment scheme	Nutrients income, kg / ha			
	N	P	K	C
Control (without fertilizers)	0	0	0	0
Manure (30 t/ha)	54	25	69	1015
NPK – equivalent PF (3 t/ha)	106	82	71	0
<b>PLANTFEED</b> (3 t/ha)	106	82	71	931
<b>PLANTFEED</b> (5 t/ha)	177	121	135	1553
N <sub>30</sub> P <sub>20</sub> K <sub>30</sub> + PF (3 t/ha)	136	102	101	931

Indicators of growth of potato and winter wheat yield relative to control indicate high efficiency of 3 t/ha of **PLANTFEED**, which is estimated by yield increase: +74% for potatoes and +23% for winter wheat (in aftereffect).

Note: fertilizers were used for potatoes of the Lugovska type: organic fertilizers - for basic cultivation of soil, mineral – for cultivation and seeding. In winter wheat of Myronivska owned wheat type only the aftereffect of fertilizer was studied.

Tabl. 4. Effect of **PLANTFEED** (PF) on yield and fertility indices of soddy cryptopodzolic soils

EFFICIENCY INDICATOR	Control (without fertilizers)	Приріст відносно контролю, +/- %				
		Manure (30 t/ha)	NPK (3 t/ha) equivalent PF	PF (3 t/ha)	PF (5 t/ha)	N <sub>30</sub> P <sub>20</sub> K <sub>30</sub> +PF (3 t/ha)
<b>Direct action of fertilizers (fertilizers used for potatoes)</b>						
Potato yield, t/ha	27,0	60	51	74	97	118
Content of mobile potassium, mg/kg	31,3	38	21	54	70	82
Content of mobile phosphorus, mg/kg	83,0	18	25	41	46	54
Cellulosolytic soil activity, %	32,0	50	16	67	88	94
Number of actinomycetes, million NCU/g	7,2	14	7,2	13	27	28
The number of phosphate-mobilizers, million NCU/g	12,1	15	6,5	20	22	28
<b>Aftereffect of fertilizers (in winter wheat crops after potatoes)</b>						
Yield of wheat, t / ha	2,23	20	16	23	37	30
Content of mobile potassium mg/kg	22,3	35	18	58	73	111
Content of mobile phosphorus mg/kg	60,3	41	30	47	52	58

If you compare the system of fertilization based on 3 t /ha **PLANTFEED** with others variants of fertilizer systems (see Table 4), then we have the following conclusions regarding yield of potato (Lugovskoy variety):

- the effect of applying **PLANTFEED** – 3 t/ha is 14% higher than after applying manure (30 t/ha) and 23.0% higher compared to equivalent doses of NPK;
- an increase of **PLANTFEED** dose from 3 t/ha to 5 t /ha (by 67%) increases the yield by 24%;
- the combination of **PLANTFEED** with mineral fertilizers (N<sub>30</sub>P<sub>20</sub>K<sub>30</sub>+ **PLANTFEED** – of 3 t/ha) increases the yield by 44% compared to 3 t/ha **PLANTFEED** (without mineral fertilizers).

On the basis of conducted field studies, the average optimal recommended dose of **PLANTFEED – 3 t/ha** has been established for fertilizing field crops for most types of soils on the territory of Ukraine.