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EFFECTIVENESS TESTING OF DIFFERENT ORGANIC FERTILIZERS ON CROP YIELDS UNDER CLIMATIC CONDITIONS OF ARGES COUNTY

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INTRODUCTION

Finding new fertilizers and formulations destined for organic agriculture has gained a lot of interest lately because are environmentally friendly, may contribute to higher yields and improve soil characteristics. The objectives of our study were to research the efficiency of three fertilizers accepted for organic agriculture (CODAMIX – F1, ECOAMINOALGA – F2 and ECOAMINOALGA PLUS – F3) on four different field crops, to evaluate their effects on yield parameters and to compare the results with those obtained in a previous experimental year.

MATERIALS AND METHODS

The experimental study was developed during 2020-2021 in Albota, Argeș County, where the dominant soil type is albic luvisols. The field crops subjected to this investigation were **winter wheat** (Trivale variety), **sunflower** (PG4 hybrid), **maize** (T.332 hybrid), **soybean** (Raluca TD variety).

RESULTS AND DISCUSSIONS

1. The efficiency of foliar fertilization with organic fertilizers on winter wheat yield parameters

Experimental variant (dose; number of treatments)	Total biomass, kg/ha	Spikes biomass, kg/ha	Seeds biomass, kg/ha	TKW, g
Control	7333	3840	2167	35.0
F1 (2.5L/ha; 2)	8867	4307	2367	34.7
F2 (2.5L/ha; 2)	12200	6157	3733	38.0
F3 (2.5L/ha; 2)	12733	6500	3900	39.7*
DL 5% =	6100	3610	2177	4.6
DL 1% =	10310	5460	3299	7.0
DL 0.1% =	16570	8780	5303	11.3

*significant difference; **distinct significant difference ***very significant difference.

3. The efficiency of foliar fertilization with organic fertilizers on maize yield parameters

Experimental variant (dose; number of treatments)	Total biomass, kg/ha	Cobs biomass, kg/ha	Seeds biomass, kg/ha	TKW, g
Control	18440	8920	7060	287
F1 (2.5L/ha; 2)	21640	10520	8100	282
F2 (2.5L/ha; 2)	22200	10980	8200	290
F3 (2.5L/ha; 2)	24260	11380	8800	320
DL 5% =	6860	3981	3376	95
DL 1% =	10382	6029	5112	144
DL 0.1% =	16688	9685	8213	232

*significant difference; **distinct significant difference ***very significant difference.

CONCLUSIONS

❖Evaluation of the efficiency of three selected inputs accepted for organic agriculture (CODAMIX – F1, ECOAMINOALGA – F2, ECOAMINOALGA PLUS – F3) on different field crops (**wheat, sunflower, maize, and soybean**) evidenced positive effects on yield parameters in comparison with control variant.

❖For **winter wheat**, the efficiency of treatments on yield parameters is following the order F3>F2>F1. Yield parameters (total biomass, spikes biomass, seeds biomass, TKW) after F3 increased with 73.64%, 69.27%, 79.97% and 13.42% respectively, in comparison with control.

❖Concerning **sunflower** crop, it has been proven that treatment with F3 produced the highest increases of yield parameters (total biomass, calatidium biomass, seeds biomass, TKW) in comparison with control, as it follows: 23.37%, 30.12%, 11.40% and 17.64%, respectively.

❖For **maize**, treatments with organic fertilizers presented positive effects on yield parameters (total biomass, cobs biomass, seeds biomass, TKW) in comparison with control variant, excepting TKW value after F1 treatment. The highest values were registered after F3 in comparison with control variant, the increases being of 31.56%, 27.57%, 24.64% and 11.49%, respectively.

❖The superiority of treatment F3 is confirmed for **soybean** by recorded values of yield parameters (total biomass, siliques biomass, seeds biomass, TKW) that increased with 7.84%, 4.49%, 11.75% and 20.4% respectively, in comparison with control variant.

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REFERENCES (selection)

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Table 1. Fertilization scheme

Experimental crop	Winter wheat	Sunflower	Maize	Soybean
Preceding crop	Maize	Wheat	Sunflower	Wheat
Basal fertilization*	300 kg/ha	300 kg/ha	300 kg/ha	300 kg/ha
First treatment application (phenophase) [†]	28.04.2021 (boot)	23.05.2021 (4-5 leaves)	27.05.2021 (5 leaves)	22.05.2021 (2 nd trifoliate leaf)
Second treatment application (phenophase) *	16.05.2021 (heading)	04.06.2021 (7 leaves)	08.06.2021 (7 leaves)	07.06.2021 (4 th trifoliate leaf)

*Basal fertilization complex NPK 20-20-0. [†]Foliar fertilization with F1, F2, F3

2. The efficiency of foliar fertilization with organic fertilizers on sunflower yield parameters

Experimental variant (dose; number of treatments)	Total biomass, kg/ha	Calatidium biomass, kg/ha	Seeds biomass, kg/ha	TKW, g
Control	9267	5533	2780	61.2
F1 (2.5L/ha; 2)	10667	5533	2890	63.0
F2 (2.5L/ha; 2)	10900	7167	3093	65.3
F3 (2.5L/ha; 2)	11433*	7200	3097	72.0**
DL 5% =	1961	2199	431	5.1
DL 1% =	2513	3359	653	9.8
DL 0.1% =	4069	5215	1049	13.2

*significant difference; **distinct significant difference ***very significant difference.

4. The efficiency of foliar fertilization with organic fertilizers on soybean yield parameters

Experimental variant (dose; number of treatments)	Total biomass, kg/ha	Siliques biomass, kg/ha	Seeds biomass, kg/ha	TKW, g
Control	5022	2605	1744	98
F1 (2.5L/ha; 2)	5334**	2688	1918*	110*
F2 (2.5L/ha; 2)	5380***	2695	1933**	111*
F3 (2.5L/ha; 2)	5416***	2722	1949**	118**
DL 5% =	155	120	126	10.2
DL 1% =	229	178	186	15.1
DL 0.1% =	355	275	289	23.4

*significant difference; **distinct significant difference ***very significant difference.