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MAXIMIZING THE GROWTH YIELD OF AGRICULTURAL PRODUCTS BY USING BACTERIAL BIOPREPARATIONS TECHNOLOGIES

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INTRODUCTION

Abstract: In order to increase and maximize the yield of agricultural crops, farmers are increasingly using an increasing amount of chemical fertilizer, thus exceeding the doses recommended by specialists, the appropriate doses for each crop. Excessive use of chemical fertilizers leads to the occurrence of pollution phenomena in agricultural ecosystems but especially the occurrence of negative side effects with high impact on soil and crops. Excess chemicalization will lead to the phenomenon of acidification of the soil, a phenomenon described as a phenomenon of excess accumulation of hydrogen ions. Soil quality is also degraded by the action of toxic aluminum ions (A13 +). Their action has a negative effect on the growth, development and maximization of plant production, decreased plant resistance to stress and reduced activity of soil biological processes and metabolism of organic matter.

The main objective of this paper is to present a new innovative technology in the field of fertilization, namely biological fertilization with live bacterial biopreparations. These new fertilization technologies are used in order to stop the degradation processes of the soil and its biological life, lately with an increasing emphasis on the use of these new technologies of living bacterial cultures. Bacterial biopreparations have the role of greening the soil by decomposing complex soil compounds into soluble forms, easily assimilated by plants, role in fixing atmospheric nitrogen in the soil and the decomposition of plant matter into organic matter that has the role of enriching the amount of nutrients needed. plant growth and development. The role of bacterial biopreparations is to recolonize the beneficial flora of the soil, to support the growth and development of plants and their production yield as well as the development of plant resistance to drought, disease or pest attack and extreme weather.

MATERIALS AND METHODS

In order to demonstrate the effectiveness of biological fertilizers, based on bacterial cultures within the Research-Development Station for Agriculture Suceava, two experiments were performed on the wheat and potato crop, as follows:

a) Potato crop

V1- unfertilized lot,

V2- fertilizer variant complex fertilizer (control lot) 600kg / ha (15:15:15) and 300kg / ha urea,

V3- biological fertilizer (15 liters / ha x 3 applications).

b) Wheat crop

V1- variant fertilizer complex fertilizer (control batch Complex 20: 20: 0 200 kg- autumn + 100 kg nitrocalcar in spring).

V2- biological fertilizer (5 liters of live culture of Azotobacter chroococcum, 5 liters of live culture of Azospirillum lipoferum and 5 liters of live culture of Bacillus megaterium 15 l / ha x 3 applications).

RESULTS AND DISCUSSIONS

After harvesting the two crops (potato and wheat) for the two lots for each crop where the experiments were performed, the following results were obtained:

	Parametrii	Producția /ha	Fractional production		
			>50 mm	30-50 mm	<30 m
Variant	V1- unfertilized lot	18.40	4	7.7	6.7
	V2-chemically fertilized lot-control lot	21.60	10.1	6.4	5.1
	V3-lot biologically fertilized	27.30	7	6.6	7.3
Differences (%)	V3 vs V2	26.39			
	V3 vs V1	48.37			
	V2 vs V1	17.39			
	V2 vs V3	-20.88			

Table 1. Potato crop production data

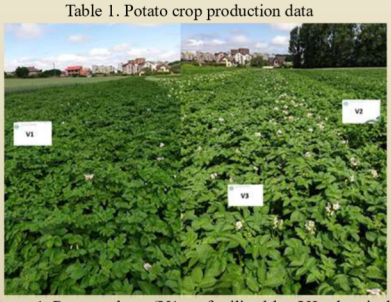

Figure 1. Potato culture (V1- unfertilized lot, V2- chemically fertilized lot, V3- biologically fertilized lot)

Parameters	V1-chemically fertilized lot-control lot	V2-lot biologically fertilized	Differences (%) V2-V1
No.of grains / m2	60	60	0.00
No.of sprouted plants / m2	43	57	32.56
No. of plants / m2 at the end of winter	47	56	19.15
No.of berries / plant	22	36	63.64
MMB (g)	4.32	4.87	12.73
Moisture at harvest%	9.1	8.7	-4.40
Plant height (cm)	23	34	47.83
Root height (cm)	4	6	50.00
Production kg / ha (pedo-climatic conditions year 2020)	3887	5471	40.75

Table 2. Wheat crop production data

Figure 2. Differences between pepper plants, the upper yellow variety. a. Rom-Agrofertil NP, b. Azoter, and c. NPK chemical fertilized plant.

CONCLUSIONS

The use of organic fertilizers (based on live bacterial cultures) leads to:

-complex beneficial association with soil microbiomes, necessary for plant growth, nutrition, stress tolerance and antagonizes their pathogens,

-the ability of plants to synthesize substances with bactericidal and fungicidal effects in order to control diseases and pests in agricultural crops,

-resistance of plants to unfavorable environmental factors (heavy metal pollution of the soil, soil salinization and drought),

-a significant increase in agricultural productivity will also lead to a large increase in seed material,

-increasing the amount of chlorophyll in plants (the appearance of a green-black) and maximizing the processes of photosynthesis and chemosynthesis,

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