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REPORT

ON THE STATE TEST OF THE

JACK ALB

PRODUCT MANUFACTURED THE COMPANY WHITE JACK 39 SRL, *MOLDOVA*, AS A FERTILIZER ON RAPESEED IN 2025

Kishinev, 2025

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INTRODUCTION

Rapeseed is one of the most important economic species of the cruciferous family. It is grown on large areas in Moldova.

4-6 tons/ha of rapeseed root residues remain in soil, which is 6-7 times more than winter wheat and 1.5-2.0 times more than forage grasses. The nutrient content in them is equivalent to that in 15 tons of manure. The equal amount is contained in straw and crop residues. Rapeseed cultivation can essentially ensure humus-free farming. Besides, sowing rapeseed in crop rotation fields prevents root rot.

The rapeseeds of modern hybrids and varieties contain 46-48% fat. In terms of taste and nutritional value, rapeseed oil is comparable to sunflower oil. The rapeseed coarse meal contains 35-40% protein and essential amino acids. Ground rapeseed contains 320 grams of protein per kilogram, which is 70 grams less than soy flour, but 180 grams more than pea flour and almost 4 times more than barley flour.

Rapeseed plants require nutrients in different quantities and ratios. It depends on the development stage and growing conditions. A sufficient amount of nutrients in the soil and additional feeding during the growing season contribute greatly to high yields. Rapeseed consumes approximately 3 times more nutrients than cereals (per unit of dry mass of the crop).

This report contains test results of the **Jack Alb** fertilizer, which is used for foliar feeding of rapeseed. Microelement content:

Jack Alb 1 Macroelements (%): K_2O – 9.0, Microelements (ppm): Cu – 450; Zn – 1100, Humic acids (salts) – 55.0%, Folic acids (salts) – 5.0 -8.0%

Jack Alb 2 Macroelements (%): N (total) – 10.0 (Nitric nitrogen – 1.87; Ureic nitrogen – 4.59; Amoniacal nitrog$_e$n – 3.88); $_K$2O – 9.0; SO3 – 2.0, Microelements (ppm): Cu – 450; Zn – 1100, Organic matter – 9.0%

Jack Alb 3 Macroelements (%): N (total) – 8.0 (Nitric nitrogen – 1.37; Ureic nitrogen – 3.53; Amoniacal nitrog$_e$n – 3.28); $_P$2O5 – 3.0; $_K$2O – 9.0; SO3 – 2.0, Microelements (ppm): Cu – 450; Zn – 1100, Organic matter – 9.0%.

I. MATERIALS AND METHODS

1. Procedure for the small-plot field experiment to determine the effectiveness of the **Jack Alb** fertilizer:

1. Test

2. Wuxal suspension, two applications during the growing season:

1st application: 4.0 l/ha in the tillering stage;

2nd application: 3.0 l/ha in the early stalk shooting stage;

4 foliar applications:

1st application: in the tillering stage

3. Jack Alb 2 – 0.2 l/ha
4. Jack Alb 2 – 0.3 l/ha

2nd application: with a 14-day interval after the first application

3. Jack Alb 3 – 0.2 l/ha
4. Jack Alb 3 – 0.3 l/ha

3rd and 4th applications: with a 2-week interval between the applications

3. Jack Alb 1 – 0.2 l/ha
4. Jack Alb 1 – 0.3 l/ha

The Jack Alb fertilizer was tested in the central zone of the Republic of Moldova on medium-loamy carbonate black soil with a humus content of 3.4% and mobile nutrients: P_2O_5 – 2.4 mg/100 g of soil according to Machigin's test method, K_2O – 27 mg/100 g of soil according to Maslova's test method and nitrification capacity of the soil – 1.4 mg/100 g. Preceding crop: winter wheat. The test was repeated four times.

The sowing plot area is 40 m^2. The tested rapeseed was of winter hybrid Arsenal (LG). We used a narrow-row sowing method with a seeding rate of 10 kg/ha, ensuring the production of 120-130 plants/m^2. The sowing was completed in September 2024. The product was applied during the growing season using a knapsack sprayer with an application rate of 300 l/ha as specified in the test procedure.

The plants were regularly examined during the growing season, and their growing periods were documented.

The crops were harvested from the entire plot area using a Sampo 130 combine harvester. The yield data were given after determining the actual humidity against the standard value of 9%.

II. OFFICIAL JACK ALB TEST RESULTS

The climatic conditions during the winter rapeseed growing period were close to the long-term annual average ones (Table 1).

Table 1.

WEATHER RECORDS FOR THE 2024-2025 WINTER RAPESEED GROWING SEASON

Parameter	**Months**					
	VIII	**IX**	**X**	**IV**	**V**	**VI**
Air temperature, °C	**25.2**	**19.7**	**11.9**	**10.6**	**13.3**	**20.7**
Average long-term temperature, °C	21.1	16.0	10.2	10.4	16.3	19.9
Deviation from the average long-term temperature, °C	+4.1	+3.7	+1.7	+0.2	-3.0	+0.8
Precipitation, mm	**17**	**191**	**59**	**22**	**126**	**21**
Average long-term precipitation, mm	45	30	30	30	45	65
Deviation from the average long-term precipitation, mm	-28	+161	+29	-8	+81	-44

Table 2.

PRECIPITATION DISTRIBUTION
IN 2024-2025, mm

months / day	2024			2025		
	VIII	IX	X	IV	V	VI
1			7			
2				5		
3	6					
4		9			4	
5		41		12	8	
6	6		21			
7			25			
8						
9					9	
10			4	3		
11		10			6	12
12						
13						
14		73				6
15		12	2			
16		5		2		
17					8	
18					7	
19		41			3	
20						
21						
22					5	
23						3
24						
25					21	
26					31	
27					22	
28					2	
29						
30	5					
31						
Total:	**17**	**191**	**59**	**22**	**126**	**21**

A very dry August was not a perfect period to sowing rapeseed, but precipitation in early September was good for sowing and germination. 59 mm of precipitation fell in October (Table 2), and positive air temperature in the autumn months contributed to the normal development of plants during this period.

The first two spring months were favorable for the rapeseed growing in terms of precipitation and temperature. 22 mm of precipitation fell in April, and 126 mm fell in May, which is above the long-term annual average amount. 21 mm of precipitation fell in June, which is significantly below the long-term annual average amount.

The Jack Alb fertilizer tested in the experiment had certain effect on the rapeseed parameters (Table 3).

Table 3.

EFFECT OF JACK ALB FERTILIZER ON THE RAPESEED HEIGHT

No.	Procedure	**Number of leaves on one plant (average of 40 plants), pcs/plant**
1.	Control samples with no fertilizers applied	7.5
2.	Wuxal suspension, two applications during the growing season: 1st application: 4.0 l/ha in the early growing stage; 2nd application: 3.0 l/ha in the early bud-formation stage;	8.5
3.	Jack Alb – 0.2 l/ha 1st application of Jack Alb 2 in the early growing stage 2nd application of Jack Alb 3: with a 14-day interval after the first application 3rd and 4th applications of Jack Alb 1 with a 2-week interval between applications	8.0
4	Jack Alb – 0.3 l/ha 1st application of Jack Alb 2 in the early growing stage 2nd application of Jack Alb 3: with a 14-day interval after the first application 3rd and 4th applications of Jack Alb 1 with a 2-week interval between applications	8.7

Before harvesting, plant samples were taken from an area of one square meter of all replications in accordance with each procedure. The samples were used to determine the dry weight, the weight of seeds per 1 m^2, and the weight of 1,000 seeds. See the measurement results in the table below (Table 4).

The given data demonstrate that the use of foliar feeding significantly improved the rapeseed yield structure indicators. The organic (air-dried) rapeseed weight, biological yield and the weight of 1,000 seeds increased significantly in all variants of application.

Table 4.

EFFECT OF JACK ALB FERTILIZER ON THE RAPESEED HARVEST STRUCTURE

No.	Procedure	Sheaf weight, g	Increase in dry weight of sheaf, %	Seed weight, g	Weight of 1,000 seeds, g
1.	Control samples with no fertilizers applied	654	100	208	2.7
2.	Wuxal suspension, two applications during the growing season: 1st application: 4.0 l/ha in the early growing stage; 2nd application: 3.0 l/ha in the early bud-formation stage;	724	110.7	234	2.9
3.	Jack Alb – 0.2 l/ha 1st application of Jack Alb 2 in the early growing stage 2nd application of Jack Alb 3: with a 14-day interval after the first application 3rd and 4th applications of Jack Alb 1 with a 2-week interval between applications	730	111.6	230	3.0

No.	Procedure	Sheaf weight, g	Increase in dry weight of sheaf, %	Seed weight, g	Weight of 1,000 seeds, g
4.	Jack Alb – 0.3 l/ha 1st application of Jack Alb 2 in the early growing stage 2nd application of Jack Alb 3: with a 14-day interval after the first application 3rd and 4th applications of Jack Alb 1 with a 2-week interval between applications	743	113.6	252	2.9

The sheaf weight harvested from 1 m^2 increased by 13.6%, the seed yield harvested from 1 m^2 increased by 44 g and the weight of 1,000 seeds increased compared to the control samples.

The positive effect of foliar application of the fertilizing agent tested in the experiment ultimately improved the crop productivity (Table 5).

Table 5.

EFFECT OF FOLIAR APPLICATIONS OF JACK ALB FERTILIZER ON RAPESEED YIELD, t/ha, at 9% moisture content

No.	Variant	Repeatability				Average	± to control samples, t/%
		I	II	III	IV		
1.	Control samples with no fertilizers applied	1.95	1.86	2.07	2.10	1.99	-/100
2.	Wuxal suspension, two applications during the growing season: 1st application: 4.0 l/ha in the early growing stage; 2nd application: 3.0 l/ha in the early bud-formation stage;	2.15	2.41	2.34	2.37	2.32	+0.33 116.6

No.	Variant	Repeatability				Average	± to control samples, t/%
		I	II	III	IV		
3.	Jack Alb – 0.2 l/ha 1st application of Jack Alb 2 in the early growing stage 2nd application of Jack Alb 3: with a 14-day interval after the first application 3rd and 4th applications of Jack Alb 1 with a 2-week interval between applications	2.20	2.38	2.18	2.30	2.27	+0.28 114.1
4.	Jack Alb – 0.3 l/ha 1st application of Jack Alb 2 in the early growing stage 2nd application of Jack Alb 3: with a 14-day interval after the first application 3rd and 4th applications of Jack Alb 1 with a 2-week interval between applications	2.36	2.35	2.21	2.32	2.31	+0.32 116.1

Least significant difference $_{05}$ - 0.19 t/ha

A significant increase in rapeseed yield was registered in all variants, in which fertilizers were used. The increase ranged from 14.1 to 16.1%.

III. FINDINGS AND RECOMMENDATIONS

1. The tested Jack Alb fertilizer that was used for foliar feeding of rapeseed plants proved to be quite effective.
2. Both variants with Jack Alb were equally effective, with an increase in rapeseed yield from 14.1 to 16.1%.
3. We recommend the State Institution — National Center for Animal and Plant Health and Food Safety to register Jack Alb as a foliar fertilizer for rapeseed plants using four treatments:

   1st application of Jack Alb 2 in the early growing stage

   2nd application of Jack Alb 3: with a 14-day interval after the first application

3rd and 4th applications of Jack Alb 1 with a 2-week interval between applications
Application rate: 0.2-0.3 l/ha.

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