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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 WHEAT**

**IN 2025**

**Kishinev, 2025**

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## INTRODUCTION

Wheat is the most widely grown crop in the world and the fourth most produced crop in the world after sugarcane, corn, and rice. Corn takes the 2nd place in terms of area.

The long history of agriculture shows that soil fertility mainly depends on the total amount of nutrients in it. It is a well known fact that agricultural crops absorb large quantities of nutrients from the soil. As crop yields increase, so does the consumption of nutrients, such as nitrogen, phosphorus, and potassium, by plants.

Consumption of nutrients by plants, washing out or binding of mobile nutrients into structurally inactive forms decrease the soil fertility. The effectiveness of mineral fertilizers largely depends on the timing and methods of application. Fertilizers are applied to wheat before sowing, simultaneously with sowing, and during the period of plant growth and development. The application methods include root and foliar feeding.

The prices of mineral fertilizers have increased significantly in the recent years. Therefore, finding ways and means to increase the efficiency of fertilizers while reducing their costs is of paramount importance. Foliar feeding by complex fertilizers is one of the most commonly used application methods.

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

**Jack Alb 1** Macroelements (%): K<sub>2</sub>O – 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; Ammoniacal nitrogen – 3.88); K<sub>2</sub>O – 9.0; SO<sub>3</sub> – 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; Ammoniacal nitrogen – 3.28); P<sub>2</sub>O<sub>5</sub> – 3.0; K<sub>2</sub>O – 9.0; SO<sub>3</sub> – 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: peas. The test was repeated four times.

The sowing plot area is 40 m<sup>2</sup>. Tested crop: winter wheat of Talisman variety. The seeding rate ensured the production of 5 million plants per hectare.

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 14%.

## **II. OFFICIAL JACK ALB TEST RESULTS**

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

*Table 1.*

**WEATHER RECORDS FOR THE 2024-2025 WINTER WHEAT 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  |

A very dry August was not a perfect period to sowing wheat, 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.

*Table 2.*

**PRECIPITATION DISTRIBUTION IN 2024-2025, mm**

| day \ months | 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            |      |    |    |      |   |    |

| day \ months  | 2024      |            |           | 2025      |            |           |
|---------------|-----------|------------|-----------|-----------|------------|-----------|
|               | VIII      | IX         | X         | IV        | V          | VI        |
| 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            |           |            |           |           |            |           |
| <b>Total:</b> | <b>17</b> | <b>191</b> | <b>59</b> | <b>22</b> | <b>126</b> | <b>21</b> |

The first two spring months were favorable for the wheat 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.

High air temperature on certain days in May and June did not affect plant productivity, as the wheat was ripening in that period and the soil moisture was good.

The tested Jack Alb fertilizer had certain effect on the wheat development (Table 3).

Table 3.

**EFFECT OF JACK ALB FERTILIZER ON THE WHEAT HEIGHT**

| No. | Procedure                                                                                                                                                                                                                                              | Plant height (average of 40 plants), cm |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| 1.  | Control samples with no fertilizers applied                                                                                                                                                                                                            | 72.4                                    |
| 2.  | Wuxal suspension, two applications during the growing season:<br>1st application: 4.0 l/ha in the tillering stage;<br>2nd application: 3.0 l/ha in the early stalk shooting stage;                                                                     | 83.5                                    |
| 3.  | Jack Alb – 0.2 l/ha<br>1st application of Jack Alb 2 in the tillering stage<br>2nd application of Jack Alb 3: with a 14-day interval after the first application<br>3rd and 4th applications of Jack Alb 1 with a 2-week interval between applications | 84.0                                    |
| 4   | Jack Alb – 0.3 l/ha<br>1st application of Jack Alb 2 in the tillering stage<br>2nd application of Jack Alb 3: with a 14-day interval after the first application<br>3rd and 4th applications of Jack Alb 1 with a 2-week interval between applications | 85.7                                    |

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 sheaf weight, the weight of seeds per 1 m<sup>2</sup>, 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 wheat yield structure indicators. The weight of a wheat sheaf and the weight of 1,000 seeds increased significantly after the application.

Table 4.

**EFFECT OF JACK ALB FERTILIZER ON THE WHEAT 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                                                                                                                                                                                                            | 821             | 100                                | 346            | 37.5                     |
| 2.  | Wuxal suspension, two applications during the growing season:<br>1st application: 4.0 l/ha in the tillering stage;<br>2nd application: 3.0 l/ha in the early stalk shooting stage;                                                                     | 885             | 107.8                              | 401            | 38.8                     |
| 3.  | Jack Alb – 0.2 l/ha<br>1st application of Jack Alb 2 in the tillering stage<br>2nd application of Jack Alb 3: with a 14-day interval after the first application<br>3rd and 4th applications of Jack Alb 1 with a 2-week interval between applications | 896             | 109.1                              | 402            | 39.0                     |
| 4.  | Jack Alb – 0.3 l/ha<br>1st application of Jack Alb 2 in the tillering stage<br>2nd application of Jack Alb 3: with a 14-day interval after the first application<br>3rd and 4th applications of Jack Alb 1 with a 2-week interval between applications | 903             | 110.0                              | 410            | 40.2                     |

The sheaf weight harvested from 1 m<sup>2</sup> increased by 10%, the seed yield harvested from 1 m<sup>2</sup> increased by 64 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  
WHEAT YIELD, t/ha, at 14% moisture content**

| No. | Variant                                                                                                                                                                                                                                                | Repeatability |      |      |      | Average | ± to control samples, t/% |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------|------|------|---------|---------------------------|
|     |                                                                                                                                                                                                                                                        | I             | II   | III  | IV   |         |                           |
| 1.  | Control samples with no fertilizers applied                                                                                                                                                                                                            | 3.39          | 3.45 | 3.38 | 3.48 | 3.42    | -/100                     |
| 2.  | Wuxal suspension, two applications during the growing season:<br>1st application: 4.0 l/ha in the tillering stage;<br>2nd application: 3.0 l/ha in the early stalk shooting stage;                                                                     | 3.95          | 4.18 | 3.80 | 4.02 | 3.99    | +0.42<br>116.7%           |
| 3.  | Jack Alb – 0.2 l/ha<br>1st application of Jack Alb 2 in the tillering stage<br>2nd application of Jack Alb 3: with a 14-day interval after the first application<br>3rd and 4th applications of Jack Alb 1 with a 2-week interval between applications | 3.84          | 3.96 | 4.05 | 4.19 | 4.01    | +0.44<br>117.3%           |
| 4.  | Jack Alb – 0.3 l/ha<br>1st application of Jack Alb 2 in the tillering stage<br>2nd application of Jack Alb 3: with a 14-day interval after the first application<br>3rd and 4th applications of Jack Alb 1 with a 2-week interval between applications | 4.15          | 4.04 | 3.97 | 4.13 | 4.07    | +0.50<br>119.0%           |

**Least significant difference  $_{0.05}$  - 0.21 t/ha**

A significant increase in wheat yield was registered in all variants, in which fertilizers were used. The increase ranged from 16.7 to 19.0%.

### III. FINDINGS AND RECOMMENDATIONS

1. The tested Jack Alb fertilizer that was used for foliar feeding of wheat proved to be quite effective.
2. Both variants with Jack Alb were equally effective, with an increase in wheat yield from 17.3 to 19.0%.
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 wheat using four treatments:  
1st application of Jack Alb 2 in the tillering 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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