

APK Vector	agro-industrial complex of the Moscow region of the Russian Federation Federal Agricultural Production Company APK Vector LLC
	OGRN 1155019001070 INN\CHECKPOINT 5019027284\501901001
	142931, Moscow region, Kashirsky district, Topkanovo village

Our Ref № 01/23 20.10.2023

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**Official production report on the use of TAL-15 liquid fertilizer with immunomodulatory and anti-stress properties based on the natural bioflavonoid dihydroquercetin during the 2021-2023 season.**

Federal Agricultural Production Company **APK Vector LLC** carried out the control and production use of TAL-15 liquid fertilizer by leaf fertilizing in the process of industrial cultivation of agricultural crops: potatoes (production), table beet, spring rapeseed (varietal), peas (production, seed), winter wheat, winter rye and barley spring during 3 agricultural seasons (2021-2023).

Below are the main results and qualitative indicators of the use of this product. The territorial zone of activity is the Moscow region, the city of Kashira.

**1. production potatoes without watering**

variety - Colombo and Gala

Mineral Nutrition Gala: NPKS nitrogen strip (15-15-15-8) – 500 kg, Carbamide (46) – 150 kg, Ammonium Nitrate – 300 kg

Mineral Nutrition Colombo: NPKS nitrogen strip (15-15-15-8) – 350 kg, Ammonium Nitrate – 300 kg

Adding TAL-15 Gala: 5-6 times in a tank mixture with fungicides

Adding TAL-15 Colombo: 4 times in a tank mixture with fungicides

**2021**

The yield of the Gala (control without TAL-15) 375 c/ha (71% of the commodity fraction 5.0+)

The yield of the Gala (TAL-15) 375 c/ha (82% of the commodity fraction 5.0+)

Waste for February 2022. Control – 17 %

Waste for February 2022. TAL-15 – 17 %

**2022**

The yield of the Gala (control without TAL-15) 380 c/ha (75% of the commodity fraction 5.0+)

The yield of the Gala (TAL-15) 415 c/ha (83% of the commodity fraction 5.0+)

Waste for February 2023. Control – 14,5 %

Waste for February 2022. TAL-15 – 13 %

**2023**

The yield of the Gala (control without TAL-15) 418 c/ha (62 % of the commodity fraction 5.5+)

The yield of the Gala (TAL-15) 460 c/ha (78% of the commodity fraction 5,5+)

**2022**

The yield of the Colombo (control without TAL-15) 220 c/ha (75% of the commodity fraction 5.0+)

The yield of the Colombo (TAL-15) 190 c/ha (90% of the commodity fraction 5,5+)

**2023**

The yield of the Colombo (control without TAL-15) 240 c/ha (82% of the commodity fraction 5.0+)

The yield of the Colombo (TAL-15) 260 c/ha (93% of the commodity fraction 5,5+)

**2. table beet**

Hybrid – Rhonda

Mineral nutrition: NPKS Azofoska (15-15-15-8) – 500 kg, Ammonium nitrate – 500 kg

Adding TAL-15: 3 times in a tank mixture with fungicides

**2023**

The yield (control without TAL-15) 400 c/ha (95% of the commodity fraction 5.0+)

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The yield (TAL-15) 425 c/ha (100% of the commodity fraction 5.0+)

### 3. Spring rapeseed – Neman variety

#### 2021

Soil preparation: heavy winter disking (up to 22cm), spring cultivation

Mineral nutrition: Pre-sowing - Carbamide (46) – 150 kg, Top dressing (double) Ammonium Nitrate – 150 + 100 kg

Adding TAL-15: 1st application - in a tank mixture with herbicides phase 3-6 of real leaves

The yield (control without TAL-15) 24 c/ha

The yield (TAL-15) 25 c/ha

Adding TAL-15 2 times:

1st - in a tank mixture with herbicides, phase 3-6 of real leaves

2nd– in a tank mixture with insecticides, the flowering phase

The yield (control without TAL-15) 24 c/ha

The yield (TAL-15) 28 c/ha

#### 2022

Soil preparation: winter plowing (up to 28 cm), spring harrowing + cultivation

Mineral nutrition: Pre-sowing - Carbamide (46) – 150 kg, Top dressing (double) Ammonium Nitrate – 120 + 150 kg

1 Adding TAL-15: in a tank mixture with herbicides, phase 3-6 of real leaves

The yield (control without TAL-15) 32 c/ha

The yield (TAL-15) 32 c/ha

Adding TAL-15 twice: 1st application - in a tank mixture with herbicides, phase 3-6 of real leaves

2nd application – in a tank mixture with insecticides, the flowering phase

The yield (control without TAL-15) 32 c/ha

The yield (TAL-15) 35 c/ha

### 4. Peas

#### 2021 the Rocket variety

Soil preparation: winter plowing (up to 28 cm), spring harrowing + cultivation

Organo-mineral nutrition: Enriched biostrate, similar in effect to AZOFOSKE – 250 kg

1 Adding TAL-15: in a tank mixture with graminicides, the culture height is up to 15 cm

The yield (control without TAL-15) 42 c/ha

The yield (TAL-15) 44 c/ha

Adding TAL-15 twice:

1st application - in a tank mixture with graminicides phase culture height up to 15 cm

2nd application – in a tank mixture with insecticides, the flowering phase

The yield (control without TAL-15) 42 c/ha

The yield (TAL-15) 53 c/ha

#### 2021 the Rocket variety

Soil preparation: winter plowing (up to 28 cm), spring harrowing + cultivation

Organo-mineral nutrition: **NPK Biostrate (5-4-4)** – 500 kg

1 Adding TAL-15: in a tank mixture with graminicides vase culture height up to 15 cm

The yield (control without TAL-15) 55 c/ha

The yield (TAL-15) 55 c/ha

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Adding TAL-15 twice:

1st application - in a tank mixture with graminicides phase culture height up to 15 cm

2nd application – in a tank mixture with insecticides, the flowering phase

The yield (control without TAL-15) 55 c/ha

The yield (TAL-15) 61 c/ha

### **2022 the Gothic variety**

Soil preparation: winter plowing (up to 28 cm), spring harrowing + cultivation

Organic nutrition: NPK Biostrate (5-4-4) – 500 kg

1 Adding TAL-15: in a tank mixture with graminicides vase culture height up to 15 cm

The yield (control without TAL-15) 64 c/ha

The yield (TAL-15) 64 c/ha

Adding TAL-15 twice:

1st application - in a tank mixture with graminicides phase culture height up to 15 cm

2nd application – in a tank mixture with insecticides, the flowering phase

The yield (control without TAL-15) 64 c/ha

The yield (TAL-15) 70 c/ha

### **2022 Lump variety**

Soil preparation: chiseling (up to 42 cm), spring cultivation

Organic nutrition: NPK Biostrate (5-4-4) – 1000 kg

1 Adding TAL-15: in a tank mixture with graminicides, the culture height is up to 15 cm

The yield (control without TAL-15) 83 c/ha

The yield (TAL-15) 83 c/ha

Adding TAL-15 twice:

1st application - in a tank mixture with graminicides phase culture height up to 15 cm

2nd application – in a tank mixture with insecticides, the flowering phase

The yield (control without TAL-15) 83 c/ha

The yield (TAL-15) 88 c/ha

### **2023 the Gothic variety**

Soil preparation: chilly heavy disking (up to 22 cm), spring cultivation

Organic nutrition: NPK Biostrate (5-4-4) – 500 kg

Adding TAL-15 twice:

1st application - in a tank mixture with graminicides phase culture height up to 15 cm

2nd application – in a tank mixture with insecticides, the flowering phase

The yield (control without TAL-15) 54 c/ha

The yield (TAL-15) 60 c/ha

### **2023 Lump variety**

Soil preparation: chiseling (up to 42 cm), spring cultivation

Organic nutrition: NPK Biostrate (5-4-4) – 500 kg

Adding TAL-15 twice:

1st application - in a tank mixture with graminicides phase culture height up to 15 cm

2nd application – in a tank mixture with insecticides, the flowering phase

The yield (control without TAL-15) 75 c/ha

The yield (TAL-15) 85 c/ha

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## **5. Winter Wheat – Turanus variety**

### **2020-2021**

Soil preparation: heavy disking (up to 22 cm), cultivation (predecessor - peas)

Organo-mineral nutrition: Pre-sowing: Enriched biostrate, similar in effect to AZOFOSKE –250 kg, feeding Ammonium Nitrate – 120 + 120 kg, Carbamide (46) – 80 kg

1 Adding TAL-15: in the tank mixture with herbicides, the tillering phase

The yield (control without TAL-15) 55 c/ha

The yield (TAL-15) 58 c/ha

Adding TAL-15 twice:

1st application - in a tank mixture with herbicides, the tillering phase

2nd application – in a tank mixture with fungicides and insecticides, the phase of the flag leaf / the beginning of the ear exit

The yield (control without TAL-15) 55 c/ha

The yield (TAL-15) 61 c/ha

### **2021-2022**

Soil preparation: plowing (up to 28cm), cultivation (precursor - steam)

Mineral nutrition: Pre-sowing Nitrogen strip NPKS (15-15-15-8) - 150 kg, Top dressing Ammonium nitrate – 120 + 120 kg, Carbamide (46) – 50 kg

Adding TAL-15 twice:

1st application - in a tank mixture with herbicides, the tillering phase

2nd application – in a tank mixture with fungicides and insecticides, the phase of the flag leaf / the beginning of the ear exit

The yield (control without TAL-15) 63 c/ha

The yield (TAL-15) 75 c/ha

### **2022-2023**

Soil preparation: stubble cultivation, pre-sowing cultivation (predecessor - peas)

Mineral nutrition: Early spring Nitrogen strip NPKS (15-15-15-8) – 150 kg, Top dressing Ammonium Nitrate – 150 + 100 kg, Carbamide (46) – 65 kg

Adding TAL-15 twice:

1st application - in a tank mixture with herbicides, the tillering phase

2nd application – in a tank mixture with fungicides and insecticides, the phase of the flag leaf / the beginning of the ear exit

The yield (control without TAL-15) 82 c/ha

The yield (TAL-15) 85 c/ha

## **6. Winter Rye – Kondratenko's Memory variety**

### **2022-2023**

Soil preparation: chiseling (up to 42 cm), cultivation (winter rye precursor)

Organo-mineral nutrition: Pre-sowing NPK Biostrate (5-4-4) – 500 kg, Top dressing Ammonium Nitrate – 150 + 150

Adding TAL-15 twice:

1st application - in a tank mixture with herbicides, the tillering phase

2nd application – in a tank mixture with fungicides, the phase of the beginning of earing

The yield (control without TAL-15) 98 c/ha

The yield (TAL-15) 108 c/ha

## **7. Spring barley – Straw variety**

### **2022**

Soil preparation: winter plowing (up to 28 cm), harrowing + spring cultivation

Mineral nutrition: Pre-sowing - Carbamide (46) – 120 kg, Top dressing – Ammonium Nitrate – 150 kg/ha

1 Adding TAL-15: in the tank mixture with herbicides, the tillering phase

The yield (control without TAL-15) 48 c/ha

The yield (TAL-15) 52 c/ha

Adding TAL-15 twice:

1st application - in a tank mixture with herbicides and fungicides, the tillering phase

2nd application – in a tank mixture with fungicides, the phase is the beginning of earing

The yield (control without TAL-15) 48 c/ha

The yield (TAL-15) 55 c/ha

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### **2023**

Soil preparation: winter plowing (up to 28 cm), harrowing + spring cultivation

Organo-mineral nutrition: Pre-sowing - Carbamide (46) – 100 kg and WMD : Enriched biostrate, similar in effect to AZOFOSKE – 250 kg, Top dressing – Ammonium Nitrate – 150 kg/ha

Adding TAL-15 twice:

1st application - in a tank mixture with herbicides and fungicides, the tillering phase

2nd application – in a tank mixture with fungicides, the phase is the beginning of earing

The yield (control without TAL-15) 65 c/ha

The yield (TAL-15) 73 c/ha

**General Director of APK Vector LLC**

**Kurakin Oleg Igorevich**