# AZOFIX

accumulate nitrogen

## AZOFIX - microbiological preparation for plants fertilizing and soil improvement

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Azofix consists of the strain of nitrogen-fixing bacteria “Azotobacter vinelandii” and biologically active substances. Nitrogen - fixing bacteria “Azotobacter vinelandii” can assimilate nitrogen from air. One part of such biological nitrogen is used by these bacteria, another part is evolved to the soil in soluble configuration which is easy available for plants. Thus, compensation of mineral nitrogen occurs in the lack of mineral nitrogen in the soil or its inaccessibility for plants. Even so, the accumulation's effect of nitrate's forms of nitrogen in products is completely absent.

In the soils which are balanced of nitrogen, nitrogen-fixing bacteria reduce of its recovery, but nitrogen-fixing bacteria enhance of outflow of vitamins, antibiotic substances and growth stimulating substances.

- Vitamins forward for regeneration of metabolic processes in plants, also vitamins enhance of photosynthesis;
- Growth stimulating su bstances (auxin) enhance of root's mass; gibberellins enhance of rate of plant's growing and its raise the level of crop-producing power;
- Antibiotic substances stimulate of resistance for affections, especially, root's affections.

Sodium's humate enhances of Azofix's affectivity because of humic acids. Humic acids enhance Azofix's growth stimulating characteristics, fungicidal characteristics and characteristics for the better fertilization of soil.

**The purpose of preparation**

- supply of plants of biological nitrogen;
- stimulation of plant's growth;
- enhancing of crop-producing power for 15-20% and more;
- enhancing of the coefficient plant's exploitation of mineral and organic fertilizers;
- improvement of soil's structure;
- formation of plant's resistance for different affections;
- descent (for 50%) of content of nitrates and nitrites in products.

**Azofix is recommended**

Azofix is recommended for root nutrition, leaf-feeding nutrition and on stubble.

**Using rates**

- root nutrition - 1 l/t seeds
- for plants - 1-2 l/ha

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## SOIL

Soil is live so like others live organism need to feed. Soil can get nutrients in many ways: it can be fertilize or could maintain “life” with agro-technical or biological means. Intensely work and enjoy there yield farmers did not see when they reached limit which they cannot walk through no matter how hard they are trying.

They are doing all the best for soil: using expensive protections and fertilizers but the yield do not grow up. Its happened because that years from years farmers were using chemical protections, lots of fertilizers and intensive agrotechnical work.

When compressing soil is formed poor conditions for microbiological process: soil becomes hard, do not breath, plants roots find themselves unfavorable and start to rot. When trying to destroy pests and disease in soil is dying and useful bacterias which supports good soil, structure mineralization and plant remains decomposition.

**In Azofix preparation are nitrogen fixing bacterias “Azotobacter vinelandii” and biological active substance which are providing plants biological bacterias and stimulates others microorganisms in soil. That influence better structure of soil and quicker decomposition plant remains.**

Azofix reduce on soil surface incrustation, soil becomes porous and the plants springing up evenly.

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## AZOFIX WITH WHEAT

Most frequently question from farmers: Azofix efficiency with different nitrogen (N) fertilizer rates?

Our answers below.

Wheat yield influence with different fertilizers (N) rates and Azofix (sprayed one time BBCH 31).
ASU test institute station, 2012.

| Experimental options | Not sprayed with Azofix | With Azofix - 1,0 l $ha^{-1}$ | The yield |
|---|---|---|---|
| $N_{100}$ $P_{60}$ $K_{90}$ | 5,93 | 6,45 | **0,52** |
| $N_{110}$ $P_{60}$ $K_{90}$ | 5,75 | 6,72 | **0,97** |
| $N_{120}$ $P_{60}$ $K_{90}$ | 5,46 | 6,78 | **1,32** |
| $N_{130}$ $P_{60}$ $K_{90}$ | 5,59 | 6,87 | **1,28** |
| $N_{140}$ $P_{60}$ $K_{90}$ | 5,73 | 6,99 | **1,26** |
| $N_{150}$ $P_{60}$ $K_{90}$ | 6,20 | 7,21 | **1,01** |
| $N_{160}$ $P_{60}$ $K_{90}$ | 6,32 | 7,32 | **1,00** |
| $R_{05}$ | 0,51 | | |

In first table first line can see that when spread $N_{100}$ and Azofix on wheat the yield increased. In second line you can sea that if you use 10kg more ($N_{100}$ - $N_{110}$) of nitrogen the yield of grain goes down ( 0,18 t $ha^{-1}$ ) but if spray Azofix with same rate of N the yield increased 0,27 t $ha^{-1}$ . Using N fertilizer and Azofix average yield - 1,05 t $ha^{-1}$. The biggest yield achieved using Azofix and $N_{120.}$

Wheat yield influence with different fertilizers (N) rates and Azofix (sprayed two times BBCH 31 and BBCH 37).
ASU test institute station, 2012.

| Experimental options | Not sprayed with Azofix | With Azofix - 1,0 l $ha^{-1}$ (sprayed 2 times) | The yield |
|---|---|---|---|
| $N_{100}$ $P_{60}$ $K_{90}$ | 5,93 | 7,14 | **1,21** |
| $N_{110}$ $P_{60}$ $K_{90}$ | 5,75 | 7,18 | **1,43** |
| $N_{120}$ $P_{60}$ $K_{90}$ | 5,46 | 6,96 | **1,50** |
| $N_{130}$ $P_{60}$ $K_{90}$ | 5,59 | 7,01 | **1,42** |
| $N_{140}$ $P_{60}$ $K_{90}$ | 5,73 | 7,17 | **1,44** |
| $N_{150}$ $P_{60}$ $K_{90}$ | 6,20 | 7,23 | **1,03** |
| $N_{160}$ $P_{60}$ $K_{90}$ | 6,32 | 7,42 | **1,10** |
| $R_{05}$ | 0,51 | | |

In second table can see that wheat sprayed two times with Azofix yield was essentially growing. Using the lowest fertilizer $N_{100}$ rate and Azofix the yield was 1,21 t $ha^{-1}$ . In this experiment average yield with N and Azofix were found - 1,30 t $ha^{-1}$. The biggest yield ( 1,50 t $ha^{-1}$ ) were reached when was used $N_{120}$ and Azofix.

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## AZOFIX WHITH RAPESEED

How useful biological preparation Azofix for rapeseed can be seen even visual. After using preparation rapeseed root grows faster and it mature more pods. Even if the yield of rapeseed are not so big , economic effect is very palpable.

Azofix influence in rapeseed yield.
Test in selected farm (1000 ha), 2012.

| Test options | The yield t ha$^{-1}$ | Difference comparing with control t ha$^{-1}$ | % | Economic evaluation investment | Profit (435 EUR/t) |
|---|---|---|---|---|---|
| Control option (selected farm with 1000 ha) growing technology | 2,9 | - | 100 % | - | - |
| (selected farm with 1000 ha) growing technology + AZOFIX 1l/ha | 3,2 | 0,3 | 110,34 | 14 EUR | 116 EUR |

After using Azofix were found reliable 0,3 t/ha bigger yield and 116 EUR profit.

Azofix influence in rapeseed yield.
Test in Aleksandro Stulginskio university test station, 2011.

| Test options | The yield t ha$^{-1}$ | Difference comparing with control t ha$^{-1}$ | % | Economic evaluation investment | Profit (435 EUR/t) |
|---|---|---|---|---|---|
| Control options F- background fertilizer | 2,23 | - | 100 % | - | - |
| F+AZOFIX 1l/ha | 2,52 | 0,29 | 113 | 14 EUR | 111,5 EUR |
| F+AZOFIX 2l/ha | 2,75 | 0,52 | 123,32 | 29 EUR | 211,5 EUR |

When it was used Azofix 1l/ha rate received 0,29 t/ha bigger yield and whet it was used 2l/ha received 0,52 t/ha bigger yield. More profitable was second option - 211,5 EUR/ha.

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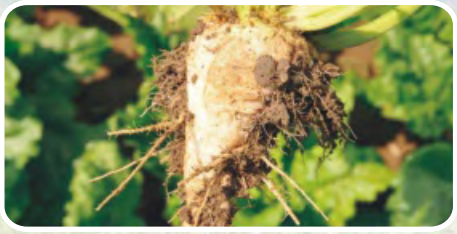

## AZOFIX WITH SUGAR BEET

Because that Azofix preparation acting through soil perhaps the greatest economic efficiency could be seen in sugar beets. Then the soil is friable its more easy for sugar beet sprout and grow. Nitrogen assimilate balance optimizes and other nutrients what determines higher yields.

Azofix influence sugar beet yield. Test in Aleksandro Stulginskio university test station, 2011.

| Test options | Yield t ha$^{-1}$ | Difference comparing with control t ha$^{-1}$ | Difference comparing with control % | Number of plants. thousands ha$^{-1}$ | Average weight of roots kg | Difference comparing with control kg |
|---|---|---|---|---|---|---|
| Control options (background NPK fertilizing) | 66,17 | - | 100 % | 85,1 | 0,777 | - |
| Sprayed with Azofix 1 time | 74,30 | 8,13 | 112,3 | 83,5 | 0,889 | 0,112 |
| Sprayed with Azofix 2 times | 75,46 | 9,29 | 114,0 | 84,8 | 0,889 | 0,112 |

Azofix sprayed on sugar beet four pairs of true leaves growth stage (17–18 BBCH), root yield significantly increased 8,13 t ha–1 (12,3 %), compared with the control where the Azofix was not used. Sugar beet sprayed twice with Azofix ( second time 5–6 pairs of true leaves growth stage ,21–22 BBCH), root yield statistically significantly increased 9,29 t ha–1 (14 %), compared with the control.

Because that was used biological preparation Azofix root grew bigger. average root weight at harvest was 112 g higher than in control plots.

Azofix influence beetroots. Test in Aleksandro Stulginskio university test station, 2011.

| Test options | Sugar content % | Difference comparing with control % | White sugar amount t ha$^{-1}$ | Difference comparing with control t ha$^{-1}$ | Difference comparing with control % |
|---|---|---|---|---|---|
| Control options (background NPK fertilizing) | 16,65 | - | 8,18 | - | 100 % |
| Sprayed with Azofix 1 time | 17,46 | 0,81 | 9,79 | 1,61 | 119,70 |
| Sprayed with Azofix 2 times | 17,64 | 0,99 | 10,08 | 1,90 | 123,20 |

On sugar beets sprayed Azofix root sugar content significantly increased 0,81–0,99 %, white sugar obtained 1,61–1,90 t ha–1 (19,7 23,2 %) more, compared with the control where the Azofix was not used. More sugary roots grew when plants were sprayed two times with Azofix.

| Test options | The yield t ha$^{-1}$ | Difference comparing with control t ha$^{-1}$ | Difference comparing with control % | Sugar content % |
|---|---|---|---|---|
| Control option (selected farm with 1000 ha) growing technology | 78 | - | 100 % | 17,54 |
| (selected farm with 1000 ha) growing technology + AZOFIX 2l/ha | 87 | 9 | 111,54 | 17,29 |

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## AZOFIX WITH CORNS

When using Azofix in corns culture you can see differences right away. Corn are very sensitive to nitrogen fertilizer rates. Azofix are making magical. Plant roots becomes stronger, green mass increases up to 35% and grain yield increase too.

| Test options | Wheat yield t ha$^{-1}$ | Difference comparing with control t ha$^{-1}$ | % |
|---|---|---|---|
| Control options (selected farm with 1000 ha) growing technology | 7,8 | - | 100 % |
| (selected farm with 1000 ha) growing technology + AZOFIX 1l/ha | 9,2 | 1,4 | 117,95 |

| Control options | Biomass yield t ha$^{-1}$ | Difference comparing with control t ha$^{-1}$ | % |
|---|---|---|---|
| Control options (selected farm with 1000 ha) growing technology | 45 | - | 100 % |
| (selected farm with 1000 ha) growing technology + AZOFIX 1l/ha | 61 | 16 | 135,56 |

In Azofix test fields the corn grain yield increase up to 1,4 t/ha (17%) or gree mass increase up to 16 t/ha (35%).

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