

HOW DOES YIELDON INCREASE PRODUCTIVITY?

Next Generation Sequencing (NGS) allows us to detect expressed genes related to increased plant productivity directly on corn and soybean. Thanks to this technology we understand the mode of action of YieldOn at molecular level:

- 1. Better transport of sugars and nutrients
- 2. Promotion of cell division > more and larger seeds
- 3. Fatty acids biosynthesis and transport*



Plants treated with YieldOn were compared to untreated control plants using Next Generation Sequencing (NGS) > This resulted in the identification of **949 differentially expressed genes for corn** and **134 for soybean**. Such differentially expressed genes are also present in other row crops of interest.

* observed in soybean only

OVERVIEW OF MOLECULAR RESULTS DESCRIBING YIELDON MODE OF ACTION

Among all the genes differentially expressed by YieldOn [949 for corn and 134 for soybean] compared to untreated, we selected the most significantly up-regulated ones, and categorized them in 3 functional categories linked to YieldOn mode of action.

MODE OF ACTION OF YieldON	RELATED GENE NAME	ACTIVITY	FOLD**	REFERENCES	INSIGHT
1. BETTER TRANSPORT OF SUGARS AND NUTRIENTS	zinc iron transporter	zinc and iron uptake and transport	27	Li, 2013	<p>YieldON improves the uptake and transport of nitrate and the microelements Zn and Fe while at the same time increases phosphate use efficiency.</p>
	asparagine synthase	ammonium/nitrogen assimilation	4	Bernard, 2009	
	SPX domain-containing protein	phosphate homeostasis (uptake, sensing)	19	Secco, 2012	
	NRT1/PTR family protein	nitrate/peptide/hormone transporter	30	Léran, 2014; Chiba, 2015	
	polyol/monosaccharide transporter	phloem loading	8	Slewinsky, 2011; Klepek, 2007	
	glutamine synthetase	nitrogen/ammonium assimilation	9	Krapp, 2015; Thomson, 2014	
	alanine aminotransferase	nitrogen assimilation	12	Good, 2007	
2. PROMOTION OF CELL DIVISION (MORE AND LARGER SEEDS)	cycloartenol/sterol methyltransferase	cell division; polarized growth	5	Carland, 2010	<p>The coordination of specific hormonal processes, including catabolism of excess cytokinins and subsequent establishment of an optimal auxin/cytokinin balance, leads to optimal cell division and proper seed development/ maturation.</p>
	cytokinin dehydrogenase	cytokinin catabolism	12	Jameson, 2016; Werner, 2003	
	iaa16 - auxin-responsive (aux iaa family member)	auxin-activated signaling, pathway, regulation of transcription	4	Czapla, 2003	
3. FATTY ACIDS BIOSYNTHESIS AND TRANSPORT	trigalactosyldiacylglycerol protein	lipid transport to the chloroplast membrane; photosynthesis	6	Nguyen et al, 2016; Hurlock, 2014	<p>Importance of fatty acids biosynthesis, a fundamental trait for value in food and industrial applications.</p>

**up-regulated genes compared to untreated test

DIRECTIONS FOR USE

Worldwide experimental trials allow us to define **the best application methods, timing and rates** at different conditions and latitudes.

METHOD OF APPLICATION	CROP	TIMING	RATE
	Wheat	1 application at flag leaf growth stage	1 -2 Pts/acre
	Soybean	2 applications: the 1st at Vn/R1 growth stage, the 2nd at R3/R5 growth stage	1 -2 Pts/acre
	Corn	1-2 applications at V10-R2 stages	1 -2 Pts/acre
	Cotton	3 applications: the 1st mixed with pesticide/herbicide treatment,the 2nd before squares appear and 3th after 3-4 weeks	1 -2 Pts/acre
	Canola	2 applications. The first mixed with pesticide/herbicide treatment, the 2° At the beginning of flowering	1 -2 Pts/acre
	Sunflower	1 application at 4-6 leaf growth stage	1 -2 Pts/acre

<h1>YIELDON TRIALS</h1>		
STATE	CROP	YIELD INCREASE VS STANDARD
Michigan	Corn	+ 4.0 bu
Ohio		+ 5.4 bu
Wisconsin		+ 8.8 bu
Illinois		+ 10.3 bu
Illinois		+17.3 bu
South Dakota	Soybean	+ 3.8 bu
Wisconsin		+ 6.7 bu
Georgia	Cotton	+ 100 lbs

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YIELDON

VALAGRO

HIGHEST CROP PRODUCTIVITY, HIGHEST RETURN FOR FARMERS

POWERED BY

Valagro switches “ON” row crop profitability. The most innovative technologies (Genomics, Phenomics and Next Generation Sequencing) are concentrated in the revolutionary YieldON: the ideal product to increase the productivity of row crops in a natural way with full respect of plant physiology. The result is an optimal return on investment for the farmer, who can count on a harvest of higher value made possible by Valagro.

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WHAT IS YIELDON ?

YieldOn is a biostimulant that increases row crop productivity by modulating cell metabolism, division, expansion, improving the transport of sugars and nutrients, and improving lipid biosynthesis and transport.

VALAGRO EXPANDS ITS PRESENCE IN THE ROW CROPS MARKET

Through innovation, passion and knowledge Valagro expands its presence in the row crops market, introducing the dedicated biostimulant YieldOn, designed to help farmers produce more and obtain the highest return of investment.



WHY CHOOSE YIELDON ?

- A NEW COMBINATION OF EXTRACTS NEVER USED BEFORE
- HIGHER RETURN FOR FARMERS
- CLEAR TECHNICAL POSITIONING AND EASY TO USE
- DEVELOPED USING HIGHLY INNOVATIVE TECHNOLOGIES
- TANK MIX COMPATIBILITY

Image below from trials conducted in Indiana.

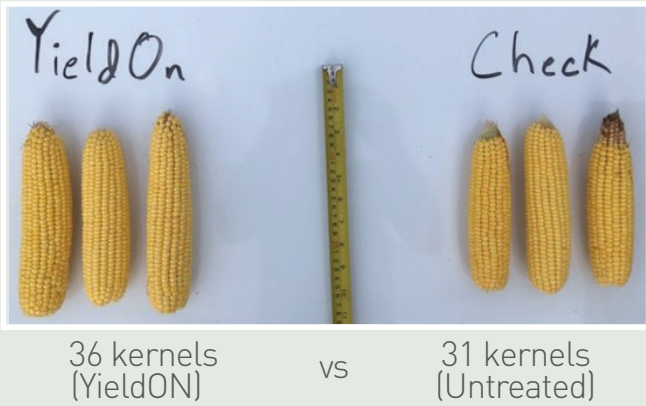


Image below from trials conducted in Ohio.



Valagro is a leader in the production and commercialization of biostimulants and specialty nutrients for use in agriculture, gardening, and industrial applications. Founded in 1980 and headquartered in Atessa, Italy, Valagro is committed to providing innovative and effective solutions for plant nutrition and care. Its mission is to increase the quantity and quality of plants and harvested crops while enhancing productivity and reducing the environmental impact of cultivations.

THE INNOVATION WAY TO GET YIELDON > GEA689*

INTEGRATED APPROCHES

We carried out an integrated "omics & field-trials" approach to characterize the physiological effect of YieldOn using different model plants (maize and soybean). In particular, we focused on gene expression and plant phenomic analyses. Thanks to the last "Next Generation Sequencing Technology" we obtained an accurate detection of all expressed genes, even for agronomically relevant crops like corn and soybean. Our results complement at the molecular and morphometric/physiological levels the evidence obtained in field trials.



*For YieldOn, the GEA code identifies the specific and distinctive application of GeaPower technology

A NEW COMBINATION OF EXTRACTS NEVER USED BEFORE!



More than 65% of the composition on a dry base, is characterized by a selection of extracts from three distinct families of plants and seaweeds enriched with trace elements Mn, Zn and Mo.



After a strict screening of different plants and seaweeds we selected these 3 families for their highest content in researched active substances.



GEAPOWER INNOVATION

Using science to harness the potential of Nature with an eye toward environmental sustainability:

This is the principle behind GeaPower, the exclusive technology platform developed by Valagro to turn potential active ingredients into high-quality nutrient solutions. A technology based on four fundamental concepts:



HIGH EFFICIENCY PHENOTYPING ANALYSIS AS A TOOL IN DEVELOPING YIELDON

3D SCANALYZER LEMNATEC PLATFORM AND DETAIL OF ONE OF THE ROOMS WITH SOYBEAN PLANT INSIDE

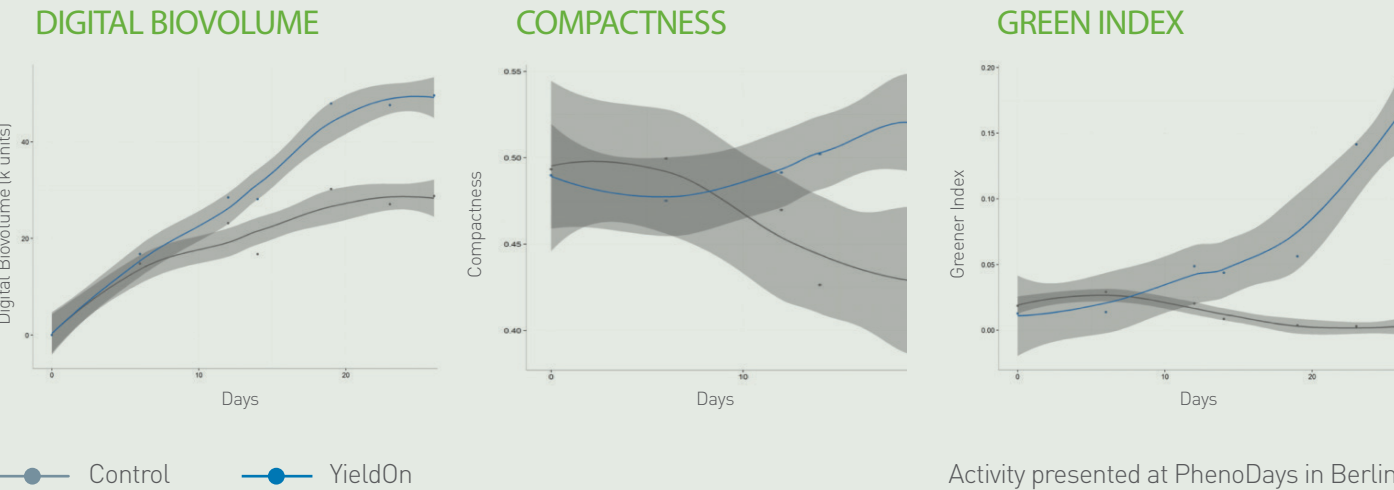


(photos by courtesy of Metapontum Agrobios)

PLANT GROWTH DYNAMICS OF SOYBEAN PLANTS UNTREATED AND TREATED WITH YIELDON



These parameters are strictly correlated to increased yield.



Activity presented at PhenoDays in Berlin