

A Premium Level Foliar Fertilizer

Edmundas Akstinas, Orij Group

Tartu, Estonia

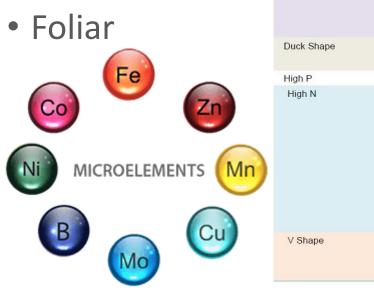
2019-02-07

Conventional vs Organic

15-15-15

Balance

- NPK formulas
- Microelements
- Granulated



	16-16-16
	17-17-17
	18-18-18
	19-19-19
	20-20-20
High K	12-11-18
	12-12-17
	15-5-20
	15-5-25
	15-8-20
	15-9-20
Duck Shape	16-16-8
	20-20-15
High P	11-19-15
High N	21-17-3
	22-9-9
	24-6-10
	24-9-9
	25-5-5
	27-6-6
	28-8-8
	30-9-9
	30-10-10
V Shape	18-8-18
	18-9- <mark>1</mark> 8
	19-9-19

- Manure
- Compost
- Low nutrient NPKs (2-2-1 etc.)

EcoPlant



The new fertilizer directive

- Already in the EU Council
- Bio-based ashes will be granted **EC** status
- Focus on circular economy principles
- Local, renewable, sustainable fertilizers
- Decrease dependability on imports

mood bottom don			01.0	0.4	H.	0.0	H.	0.0	1.4		1.1
Wood fly ash		1	1.0	15.0	24.0	0.9	0.3	2.1	0.5		1.3
					. <u>-</u>	· · -		· · <u>-</u>	··		
Wood bottom ash	1		29.0	0 4.6	5 2.7	1.0	2.9	0.6	0.2	0.2	

	1		
	2	Pre-final STRUE	BIAS Report Circulated
	3	-	•
	4	DRAFT STRUBIAS recovery r	ules and market study for
	5	precipitated phosphate salts	·
	6	oxidation materials & deriv	· C . J
	7	gasification materials in view of	
	8	Component Material Categorie	- 7
	9	Regulati	on O
	10		70
	11		27
	12		
	13 14	Dries Huygens, Hans Saveyn, Davi	
	15	Delgado Sa	
	16 17	10	other residues
	18	Circular Economy and Indu	Almond hulls #
	19	Directorate B - Growth	Almond shells #
	20	Joint Research Centre - Eu	Coconut shells #
	21	0 Fr	Coffee husks #
	22	This is a draft document, containing v	Cotton husks #
	23 24	made to this document should clearl views expressed in this document are	Grape #
	25	may not in any circumstances be re	Groundnut shells #
	26 27	position of the European Commis Commission nor any person acting o	Hazelnut shells #
C	28	responsible for the use that might be	Mustard husks #
	29 30	documer	
			Olive husks #
L		(ECN, 2017); biodat sample #	Olive pits #
		,	Olive residue #
			Palm fibres-husks #
			Palm kernels #
			FCAUIANT

Who are we?

- In the business for over 20 years
- Factory based in Ukraine
- 10 ha territory, 3 railway loading tracks
- Over 70 employees
- Annual production over 25.000 tons
- Exports to EU, China, Taiwan

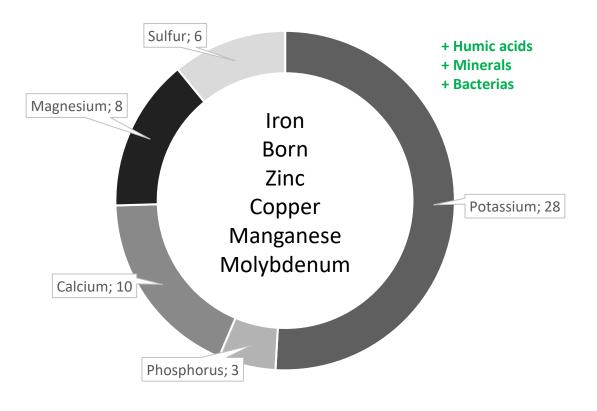






What is EcoPlant?

- Ash from sunflower husk
- Naturally alkaline with pH 10-12
- Chlorine free
- Reduces soil acidity
- Increases hummus
- Competitive element values



■ Potassium ■ Phosphorus ■ Calcium ■ Magnesium ■ Sulfur



How it's done?



Table 2. Limits for Environmental Samples (EU)

	Sample Matrix	Measured Typical Range	Max. Conc. f Contaminate Sites	
	Soil	<1 - 100	100.000	ng I-TEQ/kg d.m.
	Sediment	<1 - 200	80.000	ng I-TEQ/kg d.m.
	Air (ambient)	<1 - 100s	14.800	fg I-TEQ/m ³
Method	Parameter			Result
DR CALUX	PCDD/PCDF a	nd dl-PCBs (tot	al BEQ; sent	i) 1.3

The limits allowed in various matrices are published by the WHO and other local authorities. Examples for European environmental levels and foodstuff limits (status Feb/2007) are given below (Tables 2. & 3.). The current EU Commission Maximum Levels for dioxins are contained in Commission Regulation 466/2001, amended by Council Regulation 2375/2001. This was implemented in July 2002 and became effective February 2003. These are general guidelines, actual limits and measured concentrations can vary from country to country.

http://ec.europa.eu/environment/dioxin/download.htm





For organic?



FiBL

- Over 20 years in the business
- Experts in granulating organic matter
- ISO standards
- EU certification
- Closed cycle production



Sice States of	Sic STRATES
CONTRICATION	Christophia
	The second secon
CERTIFICATE	CERTIFICATE
of Quality Management System SIC 02.008.1361 dated 06.05.2016	of Environmental Management System SIC 02.018.1362 dated 06.05.2016
The Certification Body "Bureau of International Certification"	The Certification Body "Bureau of International Ce hereby certifies that the Environmental Management Sy
hereby certifies that the Quality Management System of	nereby certains that the Environmental Hanagement sy
"ORIY"	"ORIY"
LIMITED LIABILITY COMPANY	LIMITED LIABILITY COMPANY
Ukrame, 01103, Kylv, Kilovidze str. 26 code 23385356	Ukraine, 01103, Kyiv, Kikvidae ur. 26- code 2338336
	2102
concerning	concerning
production of mineral fertilizers Ecoplant [®] , Ecoplant-Humi [®]	production of mineral fertilizers Ecoplant [*] , I complies with requirements of the
complies with requirements of the	
ISO 9001:2008	ISO 14001:2004
"Quality management systems. Requirements"	"Environmental management systems. Requirements and guidance for use"
"Quality management systems. Requirements" INTERNATIONAL STANDARD	INTERNATIONAL STANDARD
Deer of certification: 06.05.3016 Deer of Certification: 21.86.2018	Date of Centification: Date of Salary
Date of Expiry. 21.96.2018 autgood to annual approval	Date of Expiry: subject for annual approval 2007 - w22053027
MAT · MELONDALT	Provide the second s
Head of the Centification body A. Bogoros	Head of the Certification body
GAS State St	
Paral of manufacture listering in the second science rough is builting when it is for some advance in the second science advance a	Provide of the control on the contro
RECOGERT	CERTIFICA
ATTESTATION	
MAR	Annual contract of the first of
ATTESTATION for inputs statements for use in objacent forming according to (CC) at SEA/2020 & Bel/2020 & Real/Unitons	Austice contract and protocols for the contract of the second sec
ATTENTION ATTENTION THE AND A DECEMBER OF A DECEMBER ADDRESS OF A DECEMBER OF A DECEMBER ADDRESS OF A DECEMBER OF A DECEMBER ADDRESS OF A DECEMBER OF A DECEMBER OF A DECEMBER ADDRESS OF A DECEMBER OF A DECEMBER OF A DECEMBER OF A DECEMBER ADDRESS OF A DECEMBER	And a second sec
ATTESTATUON Benedes unit also de parte favoring escontriles for (C) at Sel 2006 A 1497 John Regulations Sel 2007 A 1497 John Regulations Trainer in allo services at Services at source for the operator before,	Nº 15-045001 Nonese LLC-Otto-, is constant trans, on one statilitation Consens LLC-Otto-, is a failured at all constant transformers Consens TLC-Otto-, in Links and statility for the statility of the Consens TLC-Otto-, in Links and statility of the statility of the Consens TLC-Otto-, in Links and statility of the statility of the statility of the Consens TLC-Otto-, and statility of the statilit
ATTENDENTIAL AND A CONTRACT AND A C	A Distribution of the second secon
ATTESTATION ATTESTATION Description to a state description of menore menorementation Metalementation of the state of th	A 12-02-02 A 12-0
OTHER CONTROL OF C	A 12-02-02 A 12-0
AT EXAMPLESS AND A CONTRACT ON	
<section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><text><text><text></text></text></text></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header>	<text><text><text><text><text><text><text><text><text></text></text></text></text></text></text></text></text></text>
<section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><text></text></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header>	<text><text><text><text><text><text><text><text></text></text></text></text></text></text></text></text>
<section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><text><text><text><text></text></text></text></text></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header>	<text><text><text><text><text><text><text><text></text></text></text></text></text></text></text></text>
<section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><text><text><text><text></text></text></text></text></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header>	<text><text><text><text><text><text><text><text></text></text></text></text></text></text></text></text>
<section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><text></text></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header>	<text><text><text><text><text><text><text><text><text><text></text></text></text></text></text></text></text></text></text></text>
<section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><text></text></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header>	<text><text><text><text><text><text><text><text></text></text></text></text></text></text></text></text>
<section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><text></text></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header>	<text><text><text><text><text><text><text><text><text><text></text></text></text></text></text></text></text></text></text></text>
<section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><text><text><text><text><text><text><text></text></text></text></text></text></text></text></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header>	<text><text><text><text><text><text><text><text><text><text><text><text></text></text></text></text></text></text></text></text></text></text></text></text>
<section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><text><text><text><text><text><text><text><text><text></text></text></text></text></text></text></text></text></text></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header>	<text><text><text><text><text><text><text><text><text><text></text></text></text></text></text></text></text></text></text></text>
<section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><text><text><text><text><text><text><text></text></text></text></text></text></text></text></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header>	<text><text><text><text><text><text><text><text><text><text><text><text><text></text></text></text></text></text></text></text></text></text></text></text></text></text>



What is ZM-grow?

- Premium K,Zn,Mn,S foliar fertilizer
- Unique technology
- Spraying and seed treatment
- Closed cycle production
- Certified organic





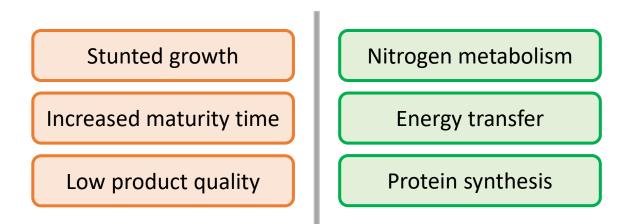








Zinc and Manganese



- Slow mobility
- Through full cycle
- Small amounts needed
- Toxic in excess
- Hard to detect



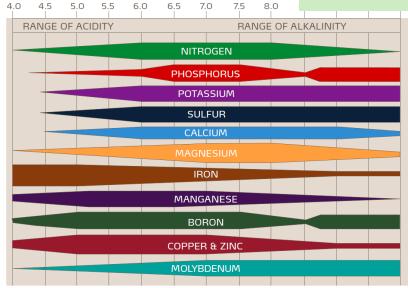








The Influence of Soil pH on Nutrient Availability

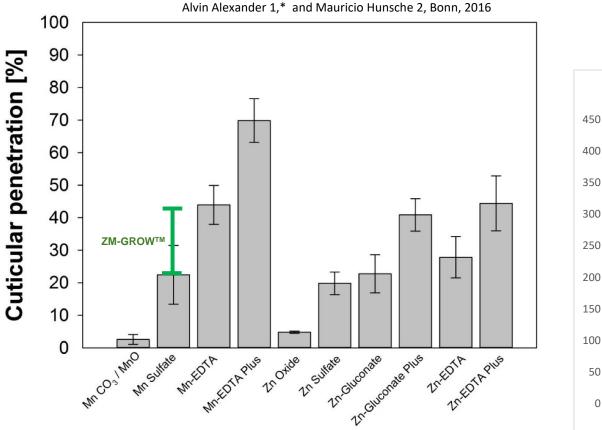




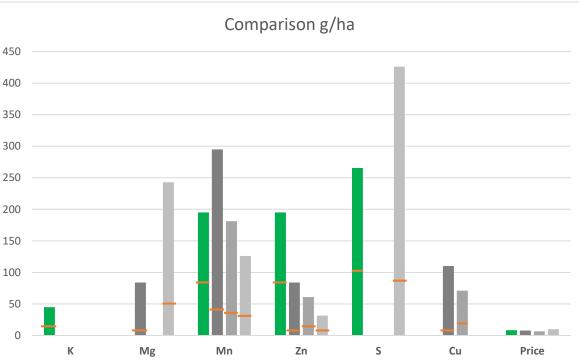




Why ZM-grow? Uptake











RUOKAVIRASTO Livsmedelsverket • Finnish Food Authority





Why ZM-grow? Mixing



- Calcium sulphate/phosphate
- Phosphorus









RUOKAVIRASTO Livsmedelsverket • Finnish Food Authority





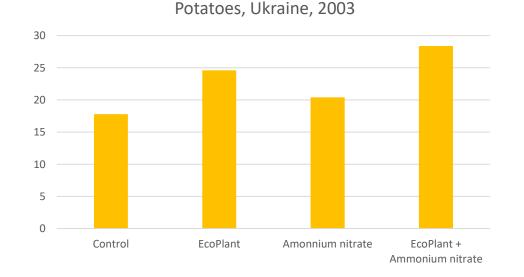




EcoPlant: Potatoes

- Product: EcoPlant
- Plant type: Potatoes
- Country: Ukraine
- Year: 2003
- Soil type: chernozem, sod-podzolic
- Partners: Ukrainian national agro academy
- Results: Increased yield from control by
 28%, EcoPlant + ammonium nitrate resulted
 in increased yield by 37%







EcoPlant: Carrots

- **Product:** EcoPlant
- Plant type: Carrots
- Country: Lithuania
- Year: 2006-2008
- Soil type: sandy loam, light loam
- Partners: LAMMC

- Carrtos, Lithuania, 2006-2008
- **Results:** In 2006 no notable yield was obtain due to the period of high drought. In 2007 EcoPlant performed best with yield increase of 46.5%. In 2008 EcoPlant resulted in yield increase of 32%.





EcoPlant: Grain (I)

- Product: EcoPlant
- Plant type: Winter wheat
- Country: Lithuania
- Year: 2010-2013
- Soil type: sandy loam
- Partners: Private farmers



• **Results:** The first year carrots where planted on two fields with fertilization EcoPlant vs. NPK. The second year cabbage was planted, same fertilization. The third year winter wheat was planted in both fields with no fertilization. On the left we see wheat after two years of EcoPlant. The field on the right had to be re-seeded.



EcoPlant: Grain (II)



- **Product:** EcoPlant humi
- Plant type: Oats
- Country: Estonia
- Year: 2018
- Soil type: sandy



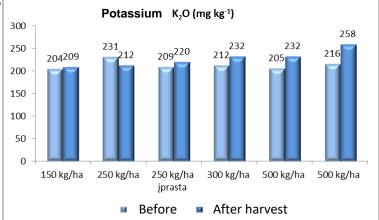
- Partners: Estonian University of Life Sciences
- **Results:** EcoPlant humi achieved the quickest yield in the first stage of growth. While the final yield did not show relative difference, EcoPlant achieved the best result in crop quality and specifications.

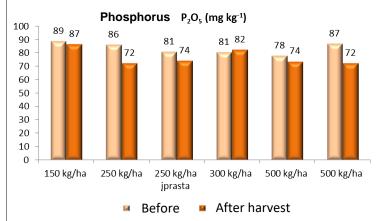


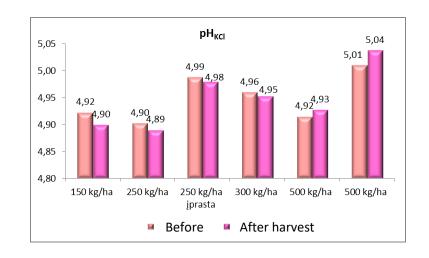


EcoPlant: Grain (III)

- Product: EcoPlant humi
- Plant type: Wheat
- Country: Lithuania
- Year: 2017
- Soil type: light and medium loam
- Partners: LAMMC
- **Results:** Element intake before / after harvest was researched. With the wheat yield of 5t/ha, Potassium,Phosporous, Calcium was replenished to the soil. Bigger dosages allow pH regulation.





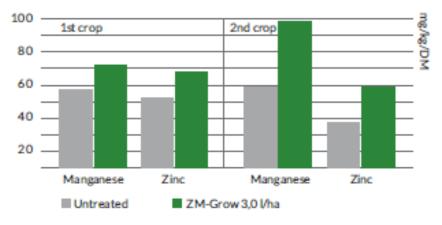




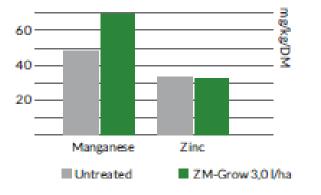
ZM-grow: 2015-2018













Let's talk more

Edmundas Akstinas

Commerce director | ORIJ GROUP

edmundas@ecoplant.ua

+370 655 20557

