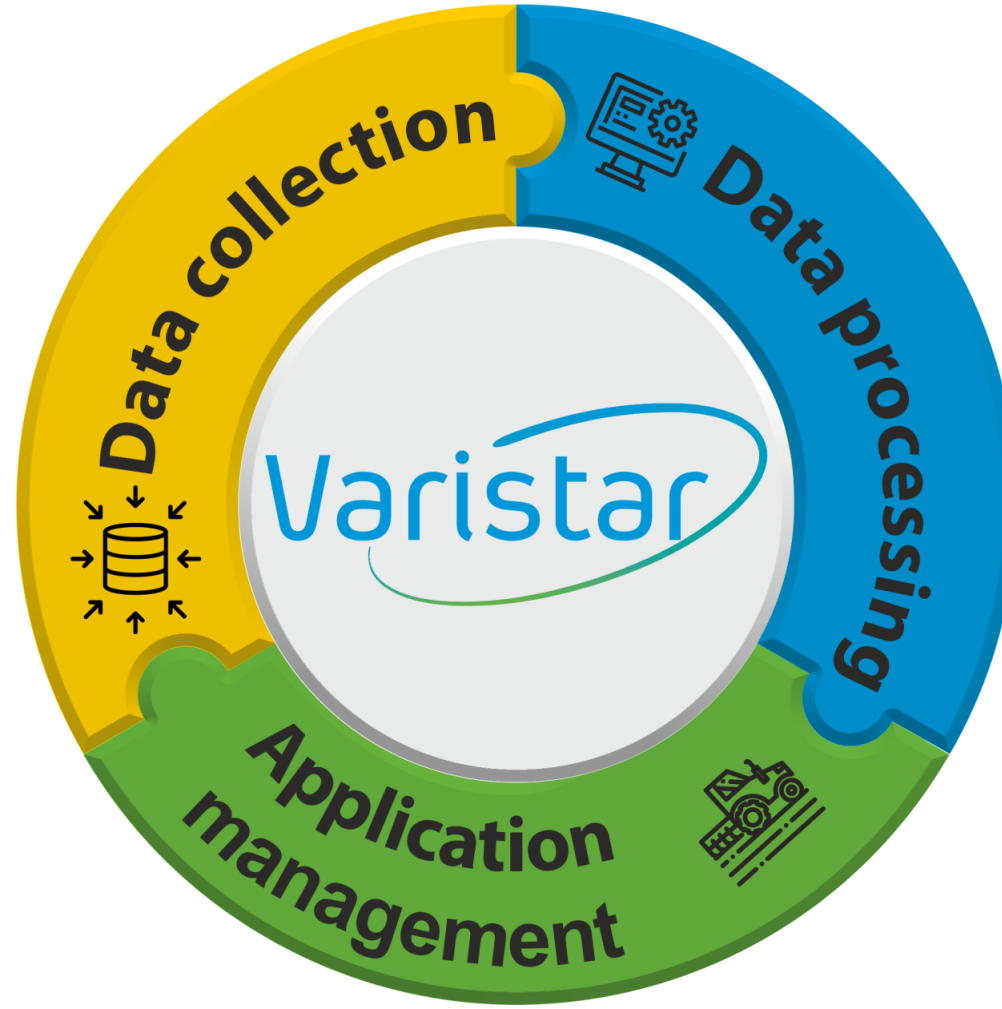




Varistar

**The first unattended management
system of variable application**

What is precision agriculture?



Yield differences within one field / hunt

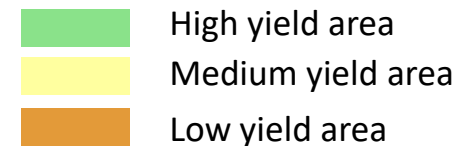
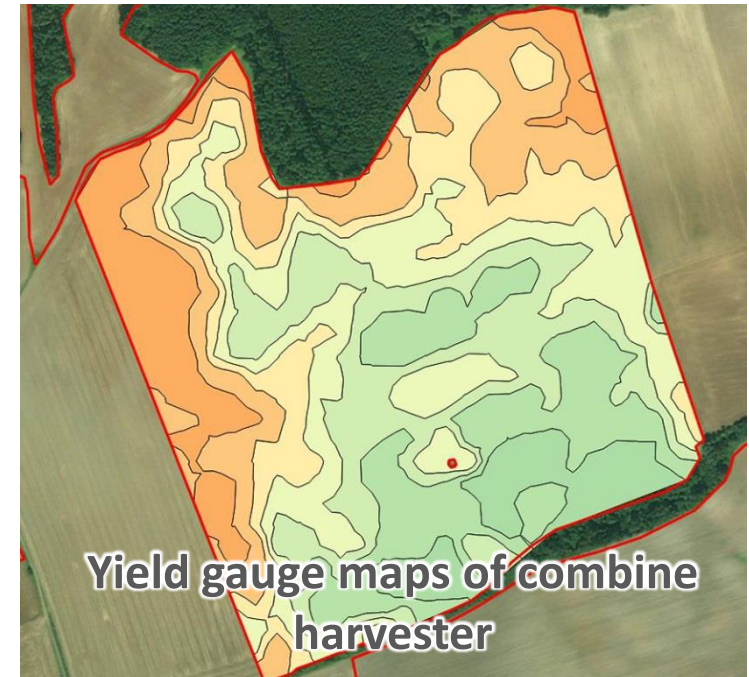
The different yield within a field is due to the number of nutrients that the plants are able to receive and the differences in soil profiles within each field / hunt.

What can we influence?

- Value pH
- Amount of N, P, K, S and microelements

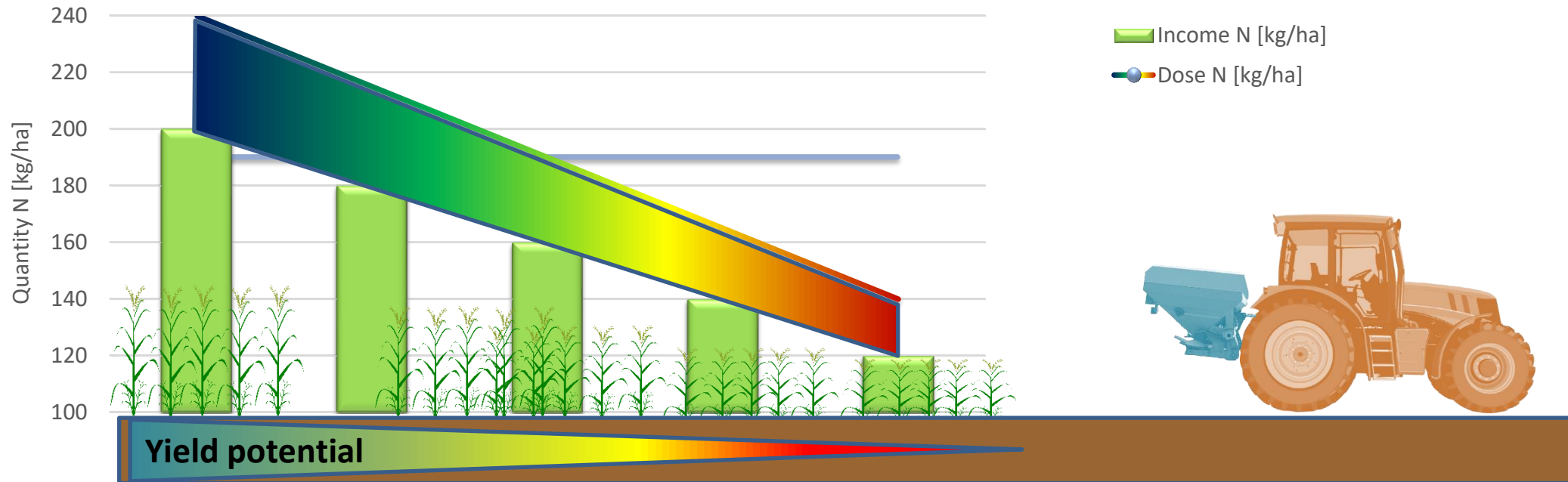
What cannot we influence?

- Type and structure of soil profile
- Relief field
- Natural water supply and movement in soil



Influence of excessive nitrogen fertilization on variable applications

Excessive use of nitrogen (N)



Excessive use of nitrogen fertilizer decreases the effect of variable applications but offers a huge potential for saving of nitrogen fertilizers.

We cooperate with prestigious scientific workplaces

- Mendel
- University
- in Brno
-



Awards

50 | Technology **Fast 50**
2020 CE **LAUREATE**
Deloitte.

Laureate
of the Deloitte 2020
Impact Star award

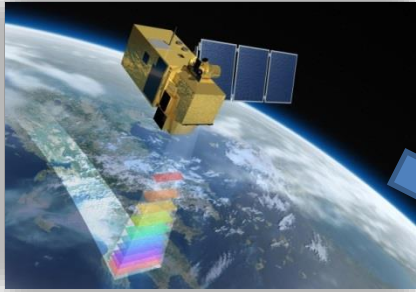
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*TOP 8 startups
in Central Europe region*

Relative yield potential maps

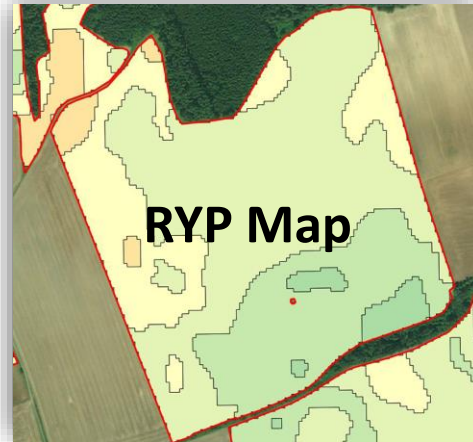
Foundation for variable applications



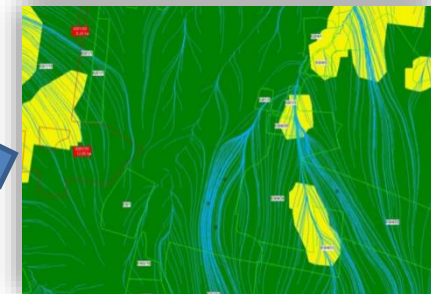
10 years of
satellite images



Soil evaluation



Historical sowing
plans (10 years)



Drain lines

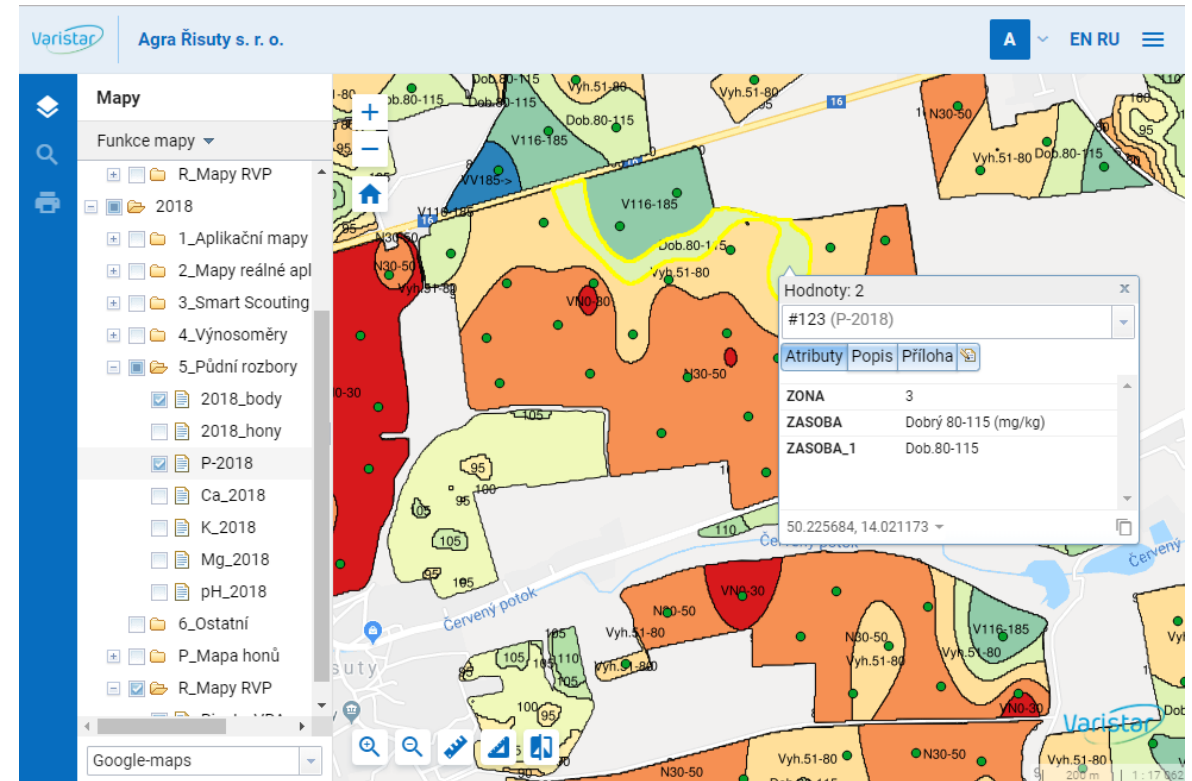
**Relative yield
potential maps**

**Yield gaugemaps of
combine harvester**

**Invest in the most
long-term highest
profit!**

Use of soil sampling data

- We use available data on pedology
- Based on processed pedology data are prepared strategies and application maps for slow release fertilization
- Type of soil data are used for preparation of variable sowing maps
- Soil data are analyzed in connection with other data sources - especially RYP maps



What is the biggest weakness of systems?

Human factor!!!

Operational work and know-how for agronomist:

- Data collection, processing and interpretation
- Preparation of relative maps of yield potential and application maps
- Evaluation and optimization of cultivation
- The tractor driver training for this system
- Ongoing application supervision and correction of errors and problems

Operational work for service personnel

- Preparing and setting up the system for each application
- In case of problems with the application, check the terminal and find the error

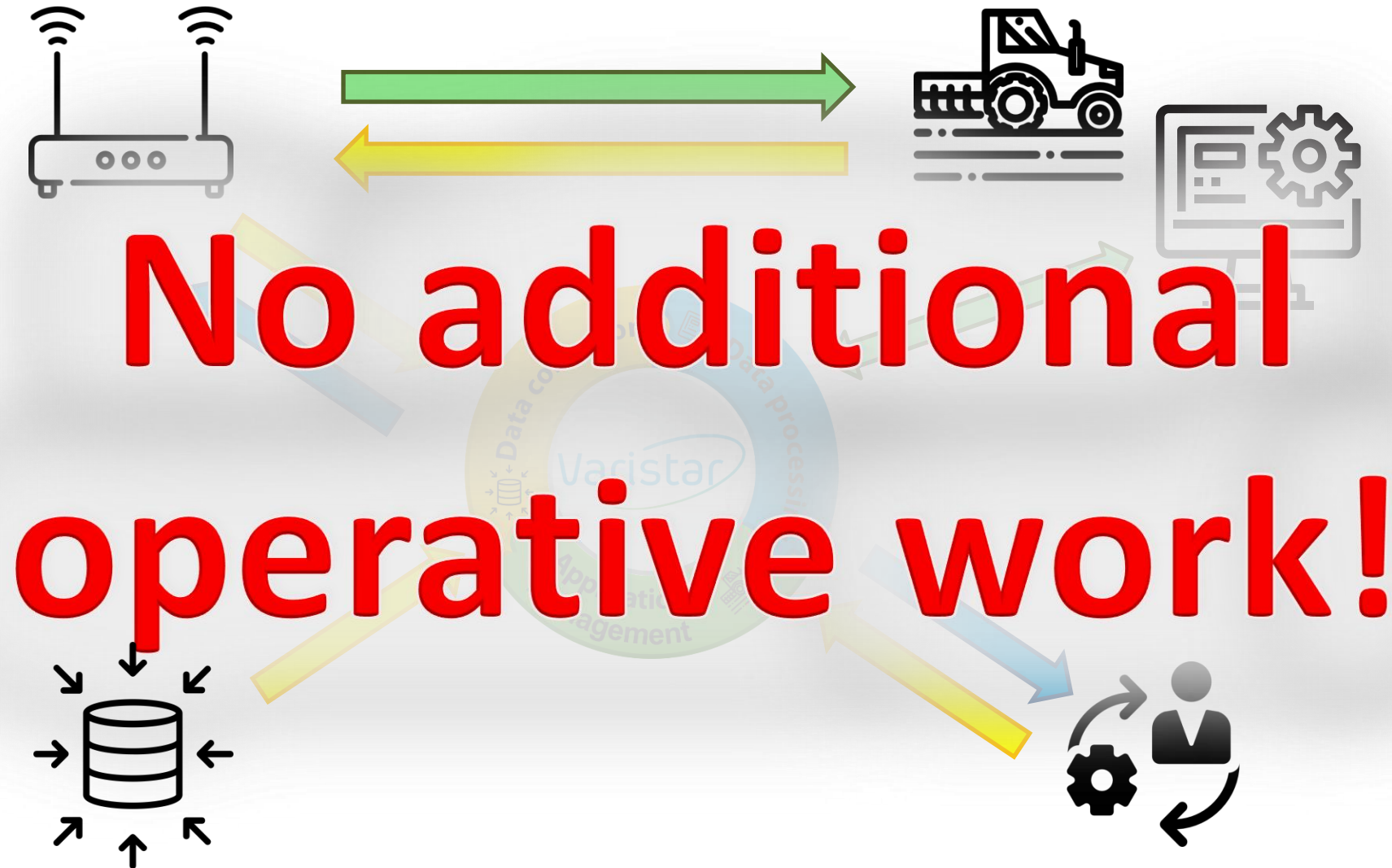
Risks

- Incorrect processing of basic data - incorrect application map or relative map of yield potential
- Incorrect terminal setting for the application cycle
- Unprofessional interference with the terminal during application

Consequences of errors

- Decrease in yield, inefficient use of products = decrease in profit

What is Varistar?



**No investment in new spreaders, sprayers
or seeders**

High compatibility of
most of today's
machinery

**Often you don't have to
invest almost anything
and you can start today.**



Compatible terminals

Integrated solution

- Direct transfer of maps to e.g. AG Leader, John Deere, Raven terminals
- Enables remote support



Compatible terminals

Varistar One

- Incredible **compatibility** with older non-ISOBUS systems
- Android base **easy to use and intuitive** user interface
- **On-line map download**
- Calculation of product consumption and application area
- **Complex remote support** without user attendance
- On-line dosage monitoring
- On-line GPS monitoring
- **Wireless connection** with machinery terminal
- Lifetime update service
- Complex **integration with Varistar portal**
- **Free of charge** withing Varistar service



Compatible terminals

Varistar Direct

- Complete **wireless data transfer**
- USB connectivity to machinery
- Direct **integration with Varistar portal**
- Complex remote support without user attendance
- Simple installation
- **Integrated GPS for machinery monitoring**
- **Wi-fi hotspot** for machinery connectivity
- Free of charge withing Varistar service



Varistar

On-line tool for fast and effective variable application ordering and creation of application maps

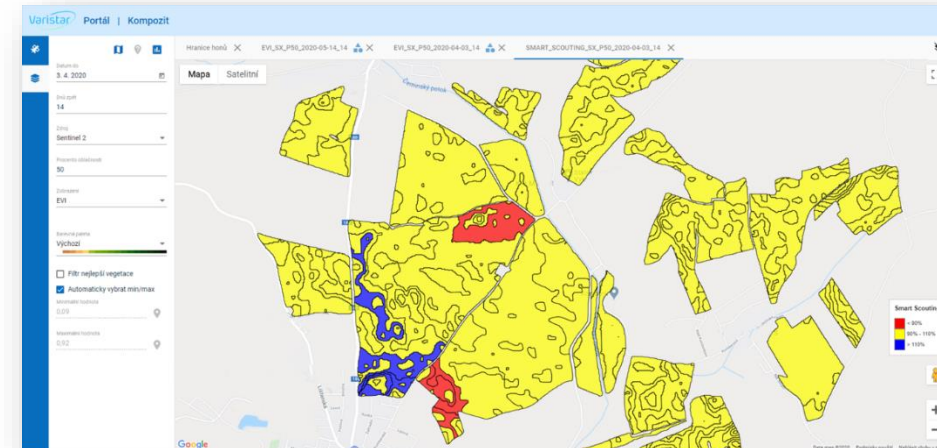
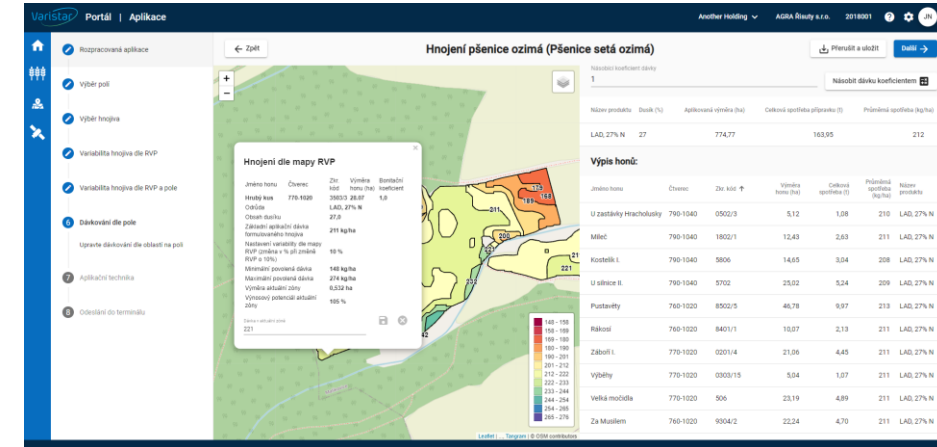
- Tool developed with support of European Space Agency
- Automated transfer of maps to agriculture machinery
- Built-in control mechanisms for detecting errors in ordering
- Assessment of non-standard assignments by an expert
- Individual modifications of application maps
- Predefined application schemes
- Possibility of preparing various application variants
- and other useful features

A simple way to interpret all current and historical data in a map form

- RYP maps, application maps, Yield gauge maps of combine harvester, soil analyzes, etc.

Satellite data - analytical tool – offers a huge possibilities to display and analyze information about fields

- Composite images creation
- Satellite images browsing
- Display of different vegetation indices



Complex service

- **Terminal instalation into machinery**

- we always completely **install the terminal in agricultural machinery, set it up and test** whether everything works and communicates correctly
- in the case of using another supplier's terminal, we will ensure communication with this supplier so that everything is ready for variable applications

- **Staff training**

- **detailed training of the personnel** who will use the terminal on site
- we also supply **elaborated detailed instructions** for all terminals
- Training how to use our portals and systém for variable applicaitons assignment

- **Service**

- Thanks to remote support, it is possible to connect to most devices remotely
- In the event that the failure is more serious and we cannot solve it with remote support and the presence of a technician is required on the spot, this service intervention on our delivered technology is completely free of charge for our clients.

- **Consultation**

- we offer consultations on individual variable applications **free of charge**
- we also provide advice for variable applications during the season

Steps of variable applications

**Lower costs +
higher yields = higher
profit / ha!**

Plant nutrition preparations
(nitrogen + slow release fertilization)

Variable sowing

Plant protection products
(Growth regulators, fungicides)

Variable soil processing

Economics vs. experiments price of a service

Calculation of economy based on parameters from ZD Křečhoř 2016 experiment			
source: CULS Prague			
Profit 56 EUR/ ha			
Only for nitrogen application.			
1. Cost of fertilization			
Fertilizer price	17,18 EUR/q	Price in EUR / ha	Savings in EUR / ha
Production fertilization (q/ha)	10,5	180,4 EUR	11,4 EUR
Qualitative fertilization (q/ha)	20	343,6 EUR	7,5 EUR
Total savings on fertilizer			18,90 EUR
2. Yield			
Selling price:	22,5 EUR/t	Profit v EUR/ha	
profit	1 158 EUR	1 196 EUR	38 EUR
3. Total increase in profit per (ha)			56 EUR

Economics according to experiments - morphoregulation

Calculation of economy for variable morphoregulation of winter rape based on pilot experiments							
Application:	35% Savings on CPP						
Culture:	winter rape						
1. Product costs		Experiment no.1			Experiment no.2		
Price of the product:		Cost in EUR / ha		Savings in EUR / ha		Savings in CZK / ha	
		uniform application		variable application		uniform application	
autumn morphoregulation		29,58 EUR		18,65 EUR		29,58 EUR	
spring morphoregulation		4,41 EUR		26,10 EUR		1,33 EUR	
Total savings per product		25,22 EUR		20,21 EUR		24,12 EUR	
2. Yield / Profit							
Selling price:		343,50 EUR/ t		variable application		Profit in EUR / ha	
		yield (t)		3,23		4,16	
Profit (EUR)		1 109,54		1 233,20		140 84 EUR	
3. Total profit increase				149,93 EUR		164,96 EUR	

Source: SOYL, UK, 2018

Yield and economics 2019/20

Crop	Area (ha)	Average yield 2019 (t/ha)	Regional average (t/ha)	Difference (%)	Farm average 2013-2018 (t/ha)	Difference (%)	Price of commodity (EUR/t)	Increase of profit/ha (EUR/ha)	Total increase of profit (EUR)
Oil seed rape	229	4,51	3,39	33,04%	3,75	20,27%	344	261	59 785
Winter barley	213	8,33	6,1	36,33%	5,90	4,19%	137	344	119
Winter wheat	208	6,55	6,55	0%	7,7	13,7%	237	259	81 311
Average increase of profit EUR/ha									259

30 years historical record in

Precipitation totals all crops

Profit increase 259 EUR/ha

	Precipitation totals (mm)
February	34
March	25,5
April	13,5
May	49
June	95

*) uneven precipitation totals 12.3-28.4. – 24 mm



Economics: trial variable sowing and fertilizing of corn

Trial area	Units	Middle dose	Variability	Nitrogen (N)
YaraVera UREA granulated 46 N	kg/ha	175	148-201	80,5
YaraMila MAIS NP 19-17	kg/ha	110	93,5-132	20,9
Corn seeds	kernel	87000	78000-95000	
Nutrino	l/ha	20	17-23	6,16
Total	kg/ha			

Control area	Units	Dose	Nitrogen (N)
YaraVera UREA granulated 46 N	kg/ha	200	92
YaraMila MAIS NP 19-17	kg/ha	200	20,9
Corn seeds	kerne	870	1,5
Total	kg/ha		114
Nitrogen consumption (N)	%		-5%

7,23 t/ha

Field Pod Horou	decrease of nitrogen					
Trial area						
Control area	51,4	52,28	51,37	51,82	52,49	51,7
Difference (t)	7,23	7,2	-0,07	-0,17	-0,22	0,29
Difference (%)	14,07%	13,77%	-0,22%	-0,33%	-0,68%	0,56%

Expense	Units	2019	2020	2021
YaraVera UREA granulated 46 N	Kč/t, Kg	303	175	200
YaraMila MAIS NP 19-17	Kč/t, Kg	113	110	110
Leptirino	Kč/l, l		20	

Gain		Price (EUR/t)	Yield – trial	Yield – control	Difference EUR
Corn silage	t/ha	29	58.63	51.4	207

Increase of profit					152EUR/ha
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What does Varistar bring to customer?

Get away from the trouble and get only the benefits

- Continuous data collection and processing
- We will prepare maps of relative yield potential for all your plots and lands
- We will set up the Varistar system for you for each application and each plot
- In case of problems with the application, we are able to remotely check everything "in the field" and look for possible errors
- We will prepare the analysis of the scanned data and connect it with other available data sources to verify the success of the cultivation interventions and enable their optimization in the future
- we archive your data for future use in the long term
- All data are provided on-line in the map

What customer get?

- Elimination of identified risks and weaknesses of precision agriculture
- No additional staff is needed
- You don't need to learn anything new
- You get online support anywhere in the Czech Republic with an available mobile phone signal
- Long-term optimization in the form of improvements based on more data captured and available
- Access to all information via the Varistar portal
- Environment friendly
- Increase in average yield per hectare
- Reduce the consumption of plant nutrition and plant protection products
- Increase in the quality parameters of crops

Significant increase in profits

What we are looking for?

- Sales and implementation partner
- We are delivering technology, know-how and full support
- Partner is provideing: sales, installation and first level support

**THANK YOU FOR YOUR
ATTENTION**

WWW.VARISTAR.CZ

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