

Agriculture of the Future

According to the Food and Agriculture Organisation of the United Nations (FAO), we will have to increase the agricultural production for 70% by the year 2050, if we want to provide enough food for the world's growing population. Across the history, we have managed to increase the productivity with the aid of innovations in agricultural machinery, agrochemicals and novel practices of land cultivation, but today, our biggest ally are information technologies – artificial intelligence, robotics, Internet of Things, 3D printing, nanotechnologies and many more. We are witnesses of the 4th industrial revolution and a huge breakthrough of personal computers, internet, sensors and smart devices in our daily lives, but these technologies have an immense potential in the field of agriculture as well. Electromagnetic probes are giving us in-depth information about soil, we are using sensors to monitor leaf wetness and the amount of minerals, while satellites and UAVs are giving us a comprehensive insight into the state of crops. Using advanced methods of machine learning and artificial intelligence, we are able to analyse massive datasets and extract new knowledge about the agricultural production and growth of crops. Furthermore, we use this knowledge to give an answer to practical questions concerning the agricultural production. Following the concept of precision agriculture, we are giving recommendations for fertilisation, irrigation and pesticide application on a metre resolution. In this way we are making sure that every plant receives a custom-tailored treatment, resources are used responsibly, risk is lowered and the yield is increased.

What does AgroSense offer to users?

AgroSense digital platform offers support in crop monitoring and planning of the agricultural activities to farmers and agricultural companies. It includes AgroSense web application, designed for PC, and AgroSense Android application, which turns a mobile phone into a new useful tool for agriculture.

The following basic services are available to users of AgroSense digital platform:

- ✦ Diary of agricultural activities
- ✦ Weather forecast for the location of the parcel
- ✦ Satellite indices of crops that describe plant growth, photosynthesis intensity and the availability of water and nutrients
- ✦ Overview of soil analysis
- ✦ Information about smart technologies used in agriculture
- ✦ Latest information about the occurrence of pests and plant diseases
- ✦ Uploading photographs of crops
- ✦ Overview of costs
- ✦ Calculators and machinery calibration

How do I access AgroSense?

Web: agrosens.rs
 Google Play Store: AgroSense App
 Further information: info@agrosens.rs
 For premium users: premium@agrosens.rs

PREMIUM SERVICES OF AGROSENSE PLATFORM

In addition to free services, AgroSense has developed a range of services for premium users, tailored according to their needs:

- ✦ Collection, visualisation and analysis of data from user's sensors: meteorological stations, soil and leaf moisture sensors...
- ✦ Storage and visualisation of data from user's sensors mounted on agricultural machinery (yield and grain moisture maps, terrain profile maps and others)
- ✦ Storage and visualization of drone images and maps of physical and chemical properties of the soil
- ✦ Delineation of management zones
- ✦ Operations management and user rights
- ✦ Incorporation of other data, defined by the user, into the system

In order to become a premium user, please send your contact details (name, surname and phone number) to premium@agrosens.rs

About BioSense

BioSense Institute is a public research institution focused on the development of digital technologies and their application in agriculture. The mission of BioSense Institute is to support the development of efficient agriculture in which we can achieve higher yields with smaller investments and less risk.

agrosens.rs

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AgroSense

**Digital
Agriculture
of Serbia**

Plant protection

Date: 03.11.2017.

Crop protection and agrotechnical operations: Diseases and pests control (Fungicides, insecticides and Acaricides)

Product: Ciptakod 20 EC

Quantity: 200 (lha or kg/ha)

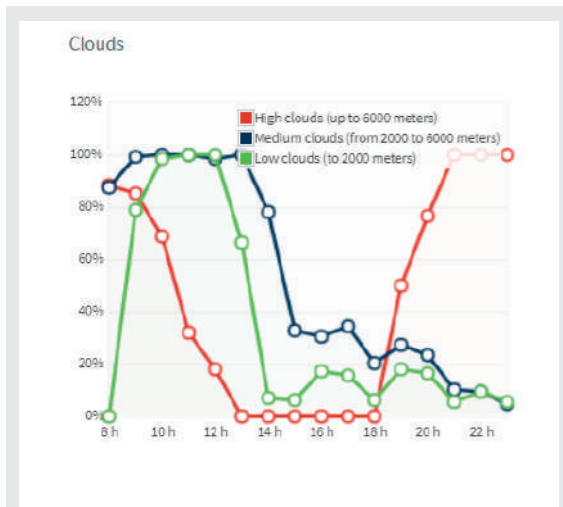
Comment: nema kukuruza

Picture: 16.09.2017

Comment: [Edit] [Delete]

Created: BioSense Institut

Digital field records – the diary of agricultural activities with the database of all chemicals registered for use in the Republic of Serbia, documented by photographs; satellite images of crops every five days give an insight into the crop growth, photosynthesis intensity and availability of water and nutrients



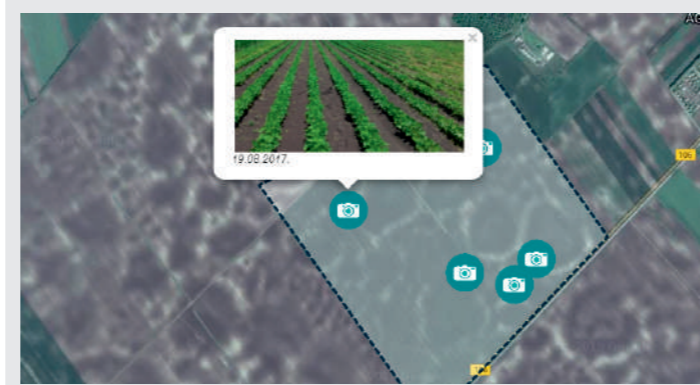
Accurate weather forecast for the location of the parcel in the next 5 days

Table date:

Date	Depth (cm)	pH KCl	pH H ₂ O	Humus	AR-P ₂ O ₅
05.07.2017.	30 cm	8.25	7.16	3.35%	45.7 mg/100g
10.10.2016.	30 cm	8.02	7.4	3.27%	25.8 mg/100g
25.01.2016.	30 cm	8.4	7.36	3.20%	21.4 mg/100g

Graph: pH KCl, pH H₂O

Soil analysis – order the soil analysis, upload the results and see how they change with time



Images of crops – document phenophases, crop growth, disease occurrence, etc.

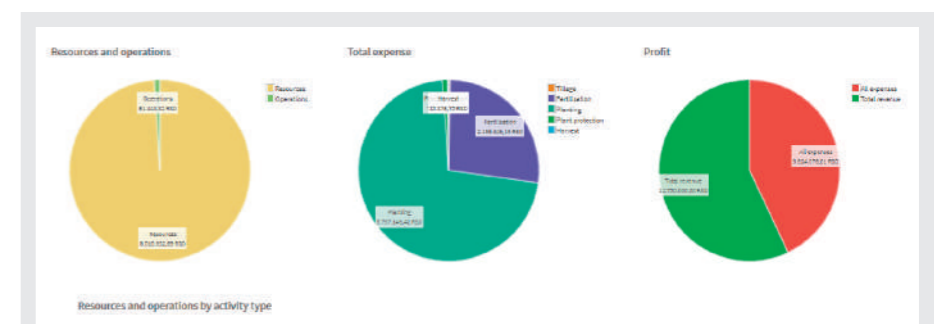
Maja Budimirović

121 postova, Ocjena: 9.81, Ocenjen: 100+

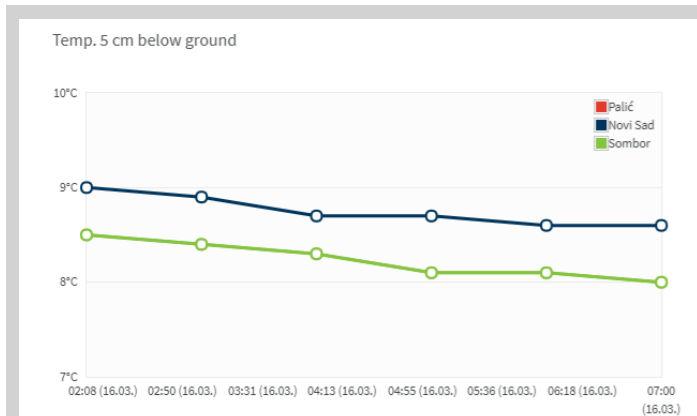
Darke Đukić

23 postova, Ocjena: 10.00, Ocenjen: 10+

Get in touch with agronomists from the region, in the area of interest (e.g. fertiliser application, pesticide application, soil sampling and analysis...), order soil analyses, drone scanning etc. The results are automatically uploaded and immediately become available across the AgroSense platform

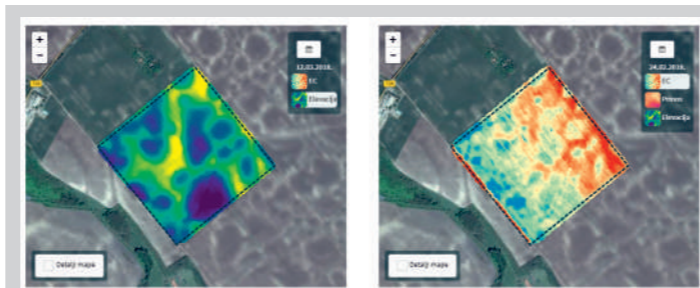


Overview and analysis of the costs at the company, parcel or crop-level



Detailed meteo data from the three nearest meteo stations, up to 7 days ago

Source of the data: RHMZ

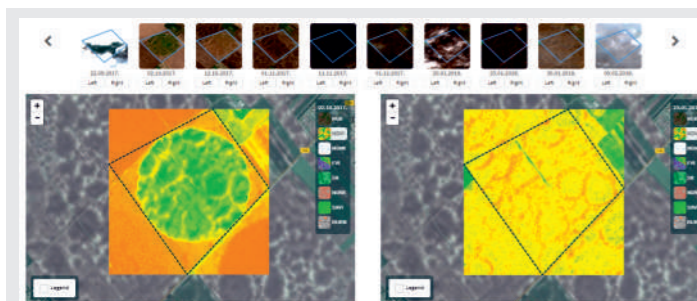


Parameter maps from probes or agricultural machinery – import the data into the system from your own sensors (yield maps, drone images, EM scans...), analyse their influences and plan the production

Zaštita ječma

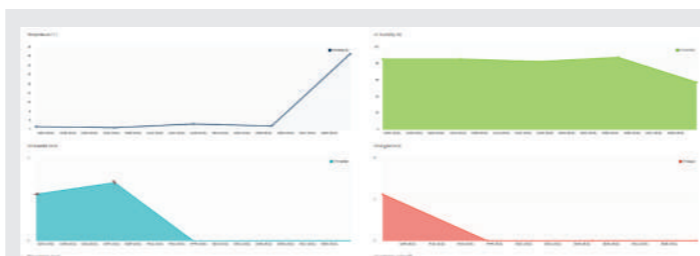
Information and alerts of disease and pest occurrence in the region of the parcel, for a given crop

Source of the data: Prognostic and Reporting Agency of Serbia



Satellite images of the European Space Agency are processed at BioSense Institute so that they show the agriculture's most important vegetation indices

Source: European Space Agency



Network of your own sensors on the field – LoRa network provides the connection to the field sensors and gives you an immediate and accurate insight into the crop development

Calculators and machinery calibration

- Harvest Loss Calculator
- In-row seed spacing calculator
- Calibration of mechanical seed drills
- Sprayer adjustment
- Spreader calibration

Calculators and machinery calibration – calculating different parameters of agricultural machinery with the goal of achieving the desired performance.

