



HAPIH

**Hrvatska agencija za
poljoprivredu i hranu**

Croatian Agency for
Agriculture and Food

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The use of geospatial and land registry databases in plant health surveys in Croatia

Croatian Agency for Agriculture and Food – Center for Plant Protection
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Introduction

Precise locating, recording and monitoring of quarantine and other economically important harmful plant organisms on the national territory is one of the prerequisites:

- successful phytosanitary policies,
- implementation of phytosanitary measures (eradication of harmful organisms and prevention of their spread, determination of demarcated areas or official establishment of areas or places of production free of certain harmful organisms)
- design and adoption of strategic plans in the field of plant health, planning and implementation of plant quarantine, assessment and effective risk management of harmful organisms.



Introduction

Plant health surveys – **risk-based**

Risk assessment

Statistically based surveys

Locations of phytosanitary measures?

Plant hosts?

Operators?

Feasible and digitalized process?

Timely reporting?



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Introduction

Modern information technologies today enable:

- very precise location and recording of field activity observations using equipment available to everyone (mobile devices, tablets, etc.),
- rapid transfer of information,
- simultaneous use,
- updating and monitoring.



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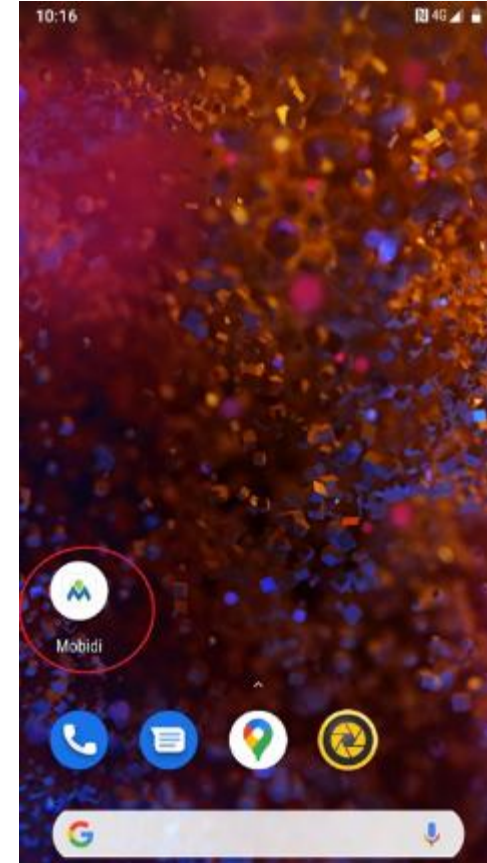
Implementation

- Plant Protection Center in cooperation with the Ministry of Agriculture has initiated the development and introduction of a software solution for monitoring harmful organisms in the Republic of Croatia
- During 2018 and 2019, the software solution was developed in cooperation with IT experts, plant protection specialists, employees of the Ministry of Agriculture and phytosanitary inspectors
- Model for development: Flavescence dorée phytoplasma



Functionalities

- The mobile part of the application
- Office part of the application

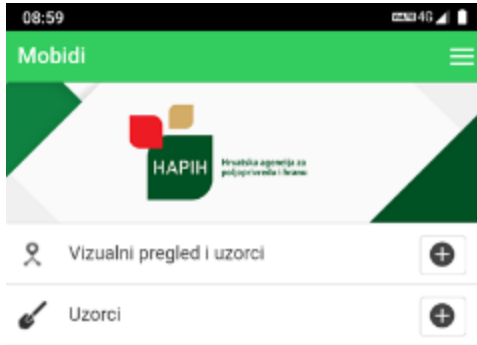


Databases

- **ARKOD** - a record of agricultural land use in digital form
- **Geoportal DGU** - information system of land registers and cadaster
- **Maps of demarcated areas**
 - *Grapevine flavescence dorée phytoplasma* (PHYP64)
 - *Aleurocanthus spiniferus* (ALECSN)
 - *Anoplophora chinensis* (ANOLCN)



The mobile part of the application



- field data collection
 - visual inspections
 - sampling
- recording GPS points (coordinates)
- geotagged photos

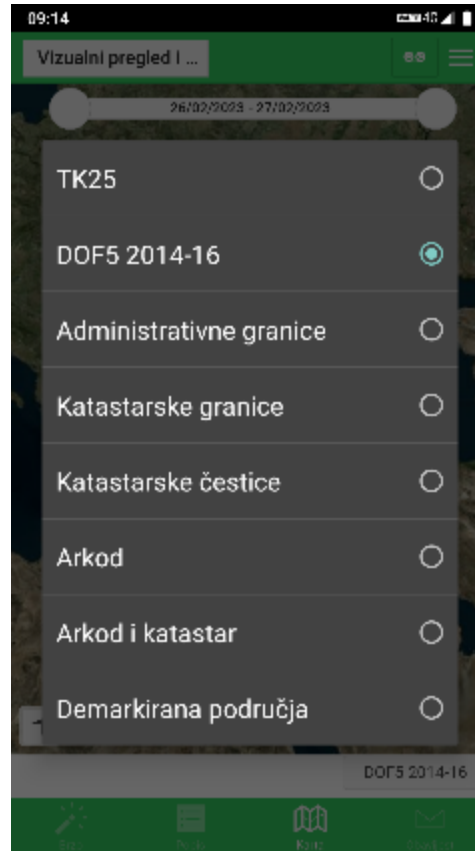


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The mobile part of the application

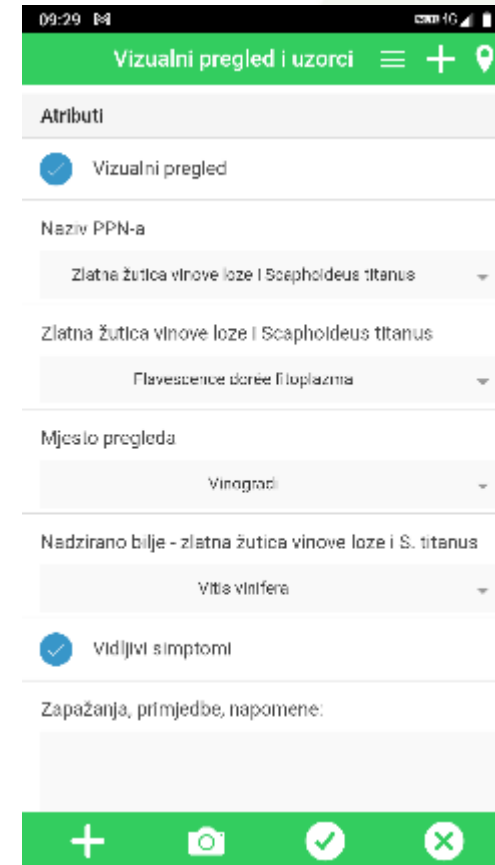


- Layer selection

The mobile part of the application

- **Visual inspections**

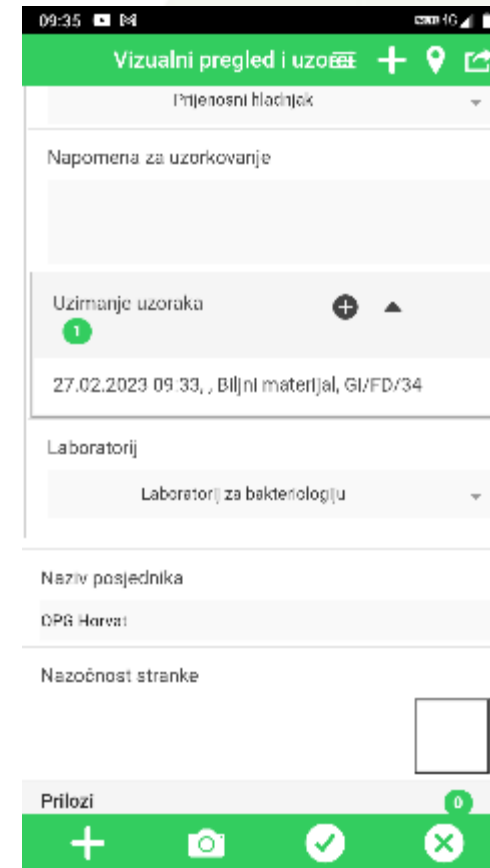
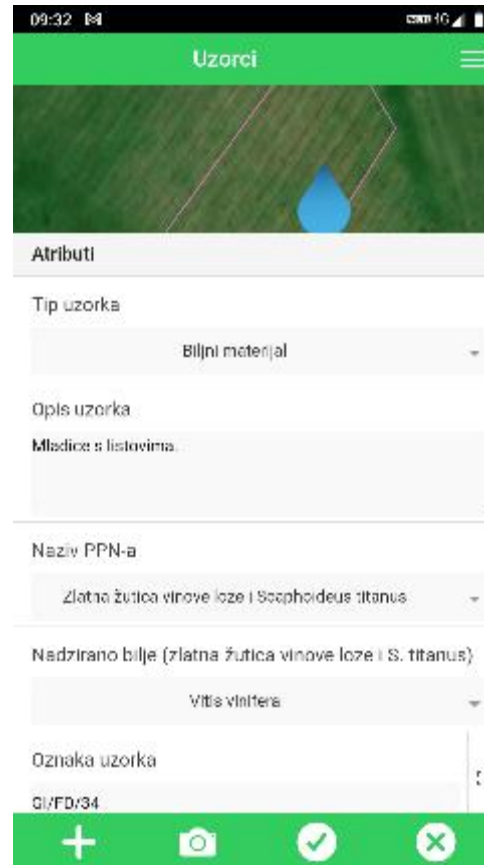
- marking polygons (minimum three points)
- selection of controlled harmful organism
- controlled plants
- other



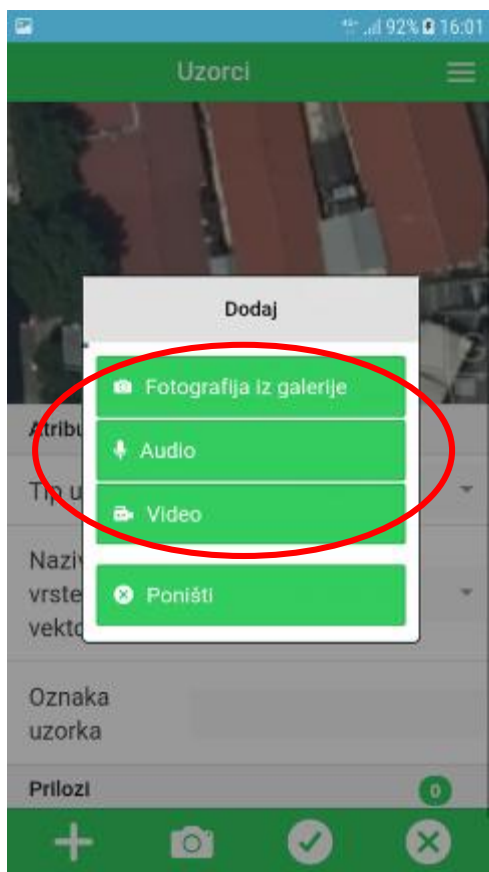
The mobile part of the application

- **Sample collection**

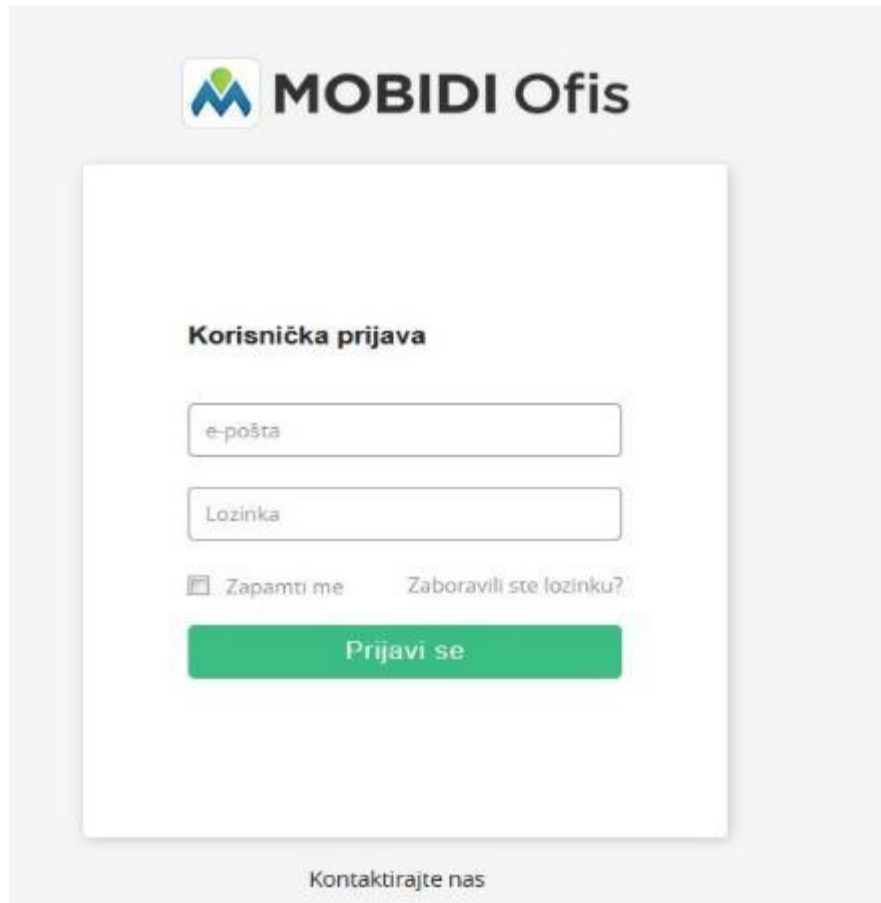
- sample type
 - sample description
 - sample label
 - other
-
- precise positioning of the location from which the sample was collected!



The mobile part of the application



Office part of the application



The screenshot shows the login interface for 'MOBIDI Ofis'. At the top left is the logo, which consists of a stylized 'M' made of three colored shapes (blue, green, and orange) followed by the text 'MOBIDI Ofis'. Below the logo, the heading 'Korisnička prijava' is centered. Underneath this heading are two input fields: the first is labeled 'e-pošta' and the second is labeled 'Lozinka'. Below the password field, there is a checkbox labeled 'Zapamti me' and a link 'Zaboravili ste lozinku?'. A large green button with the text 'Prijavi se' is positioned below these elements. At the bottom of the page, there is a link 'Kontaktirajte nas'.

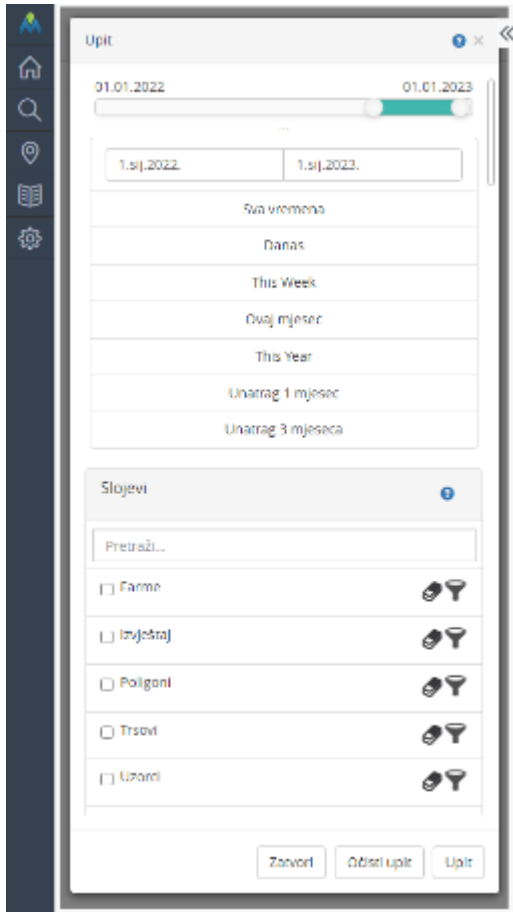
- User login to the office part of the application

Office part of the application

- Storage, processing and possible correction of collected data

1. Entering a new record
2. Entering photos (if available)
3. Entering data on plant material
4. Plotting (vectorization)
5. Vectorization of polygons based on photo interpretation
6. Deleting a record
7. Changing a record
8. Changing data
9. Adding a polygon
10. Adding a point
11. Printing a record

Office part of the application



- Data filtering

Records can be filtered by:

- date of record entry,
- to the user who enters the records,
- Record ID number,
- groups,
- layers,
- record display options.

Office part of the application - results

The screenshot displays a web application interface for inspection results. On the left, a sidebar contains navigation icons. The main area shows a list of inspection results under the heading 'Rezultati upita'. The list includes entries with IDs, names, and dates. Entry 2189, 'Goran Ivančan, 8.09.2022', is highlighted with a red circle. A red arrow points from this entry to the detailed view on the right.

The detailed view for entry 2189 is titled '2189: Goran Ivančan, 8.09.2022 (08. 09. 20...'. It is divided into three sections:

- Informacije o zapisu**: A table with fields for personal and identification data.
- Informacije o vremenu**: A table with fields for recording and creation times.
- Ostale informacije**: A section for additional information.

Informacije o zapisu	
Ime osobe koja unosi podatke	Goran Ivančan
ID pregleda	2189
OIB posjednika	22339250015
MIBPG posjednika	159523
Broj katastarske čestice	263/1
Katastarska općina	KAPFI ICA
Broj katastarske općine	309737
Adresa posjednika	KAPFI ICA 101
Broj poštanskog ureda	43280
Naselje	Kapelica
Županija	Bjelovarsko-bilogorska županija
E-pošta	matija.zabio@gmail.com
Telefon	043532272
Uzorke dostavio posjednik	<input type="checkbox"/>
U planu nadzora	<input type="checkbox"/>
Vizualni pregled	<input checked="" type="checkbox"/>
Naziv PPN-a	Zlatna žutica vinove loze I Scaphoideus titanus
Zlatna žutica vinove loze I Scaphoideus titanus	Scaphoideus titanus
Mjesto pregleda	Vinogradi
Nadzirano bilje - zlatna žutica vinove loze I S. titanus	Vitis vinifera Vitis spp.

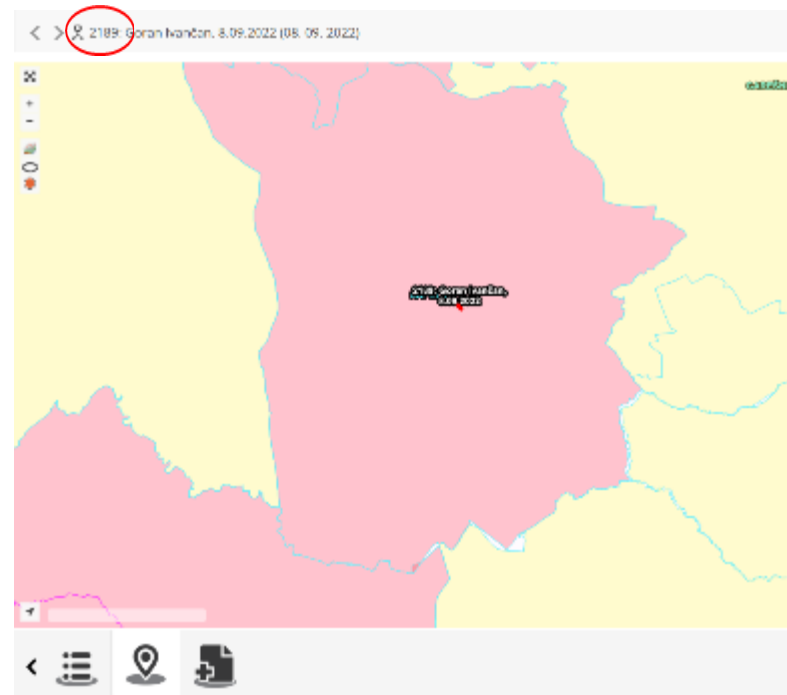
Informacije o vremenu	
Vrijeme zapisa	08. 09. 2022. 09:47:50
Vrijeme stvaranja	12. 09. 2022. 09:46:46

Ostale informacije

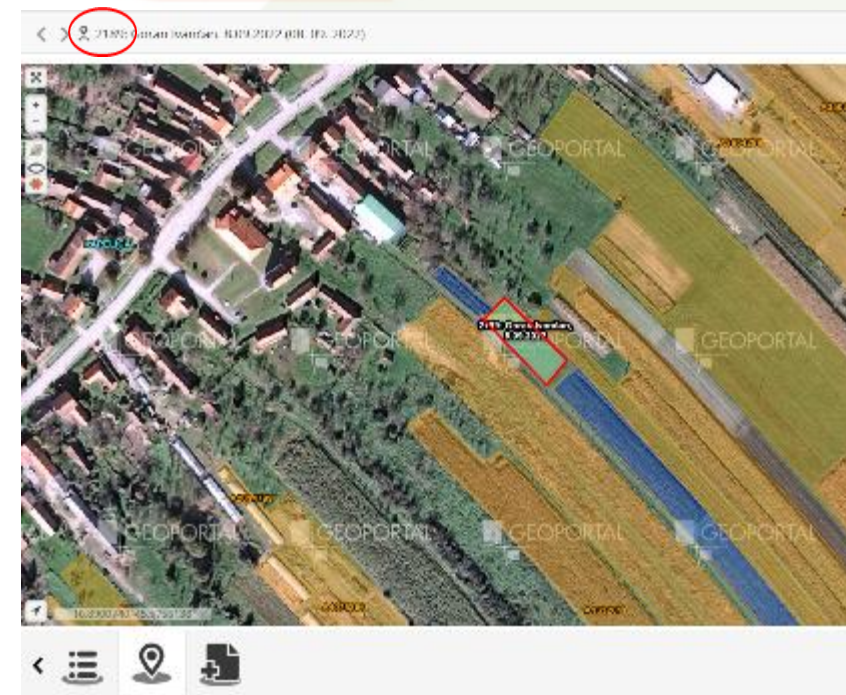
Office part of the application - results



Geoportal DGU



Maps – demarcated areas



ARKOD

- The system generates a paper record from the databases.

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Results - alphanumeric data and data filtering

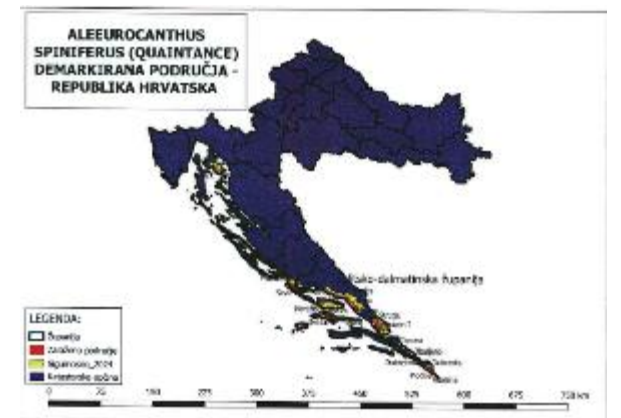
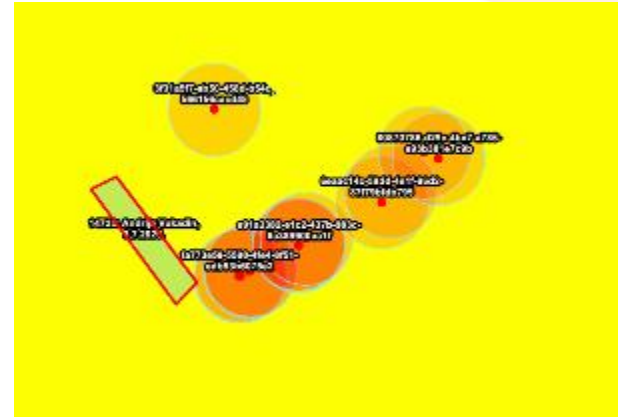
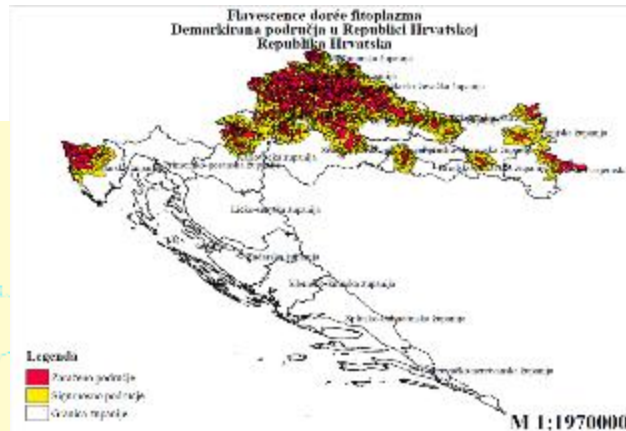
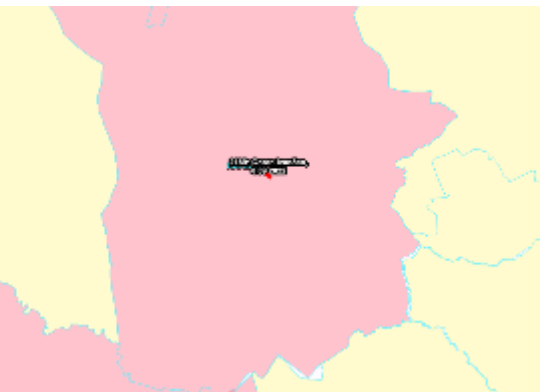
- Excel data base
- quick and easy reporting

The screenshot shows an Excel spreadsheet with a large table of data. The table has multiple columns, including dates, locations, and analysis results. The data is organized in a structured manner, with rows representing individual samples or analyses.

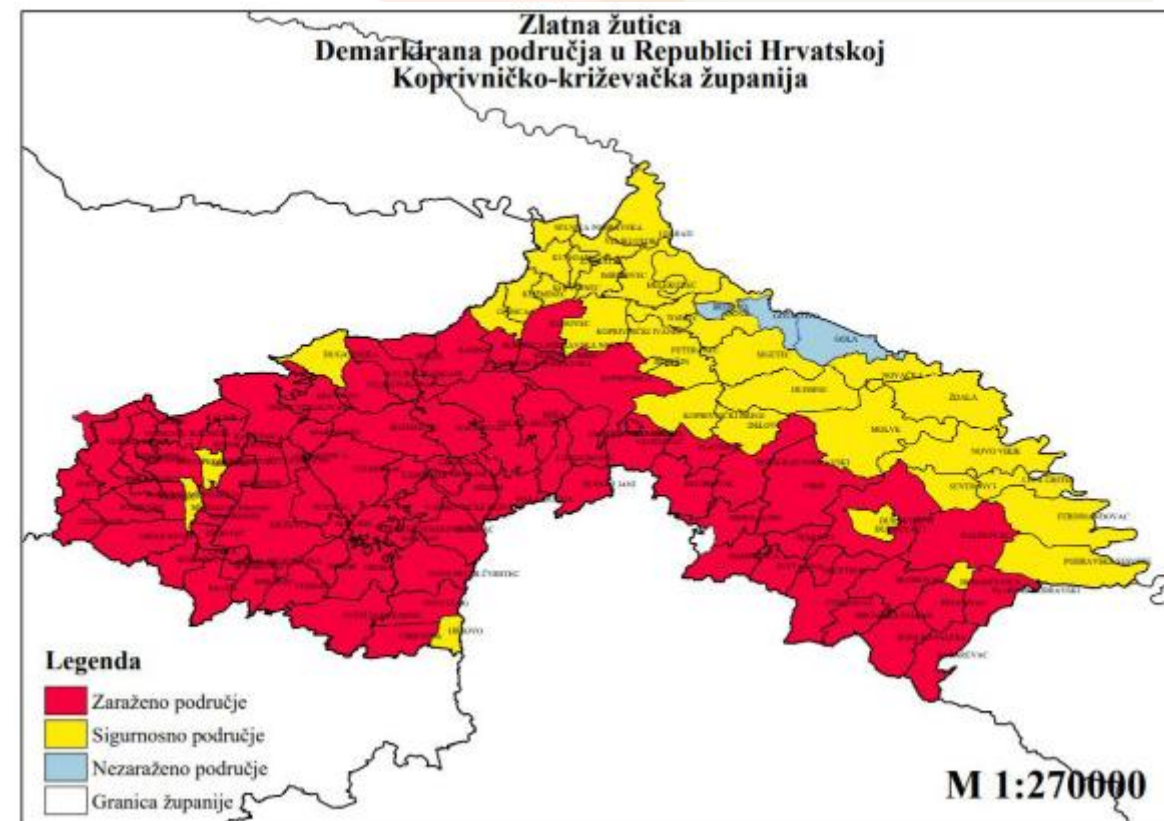
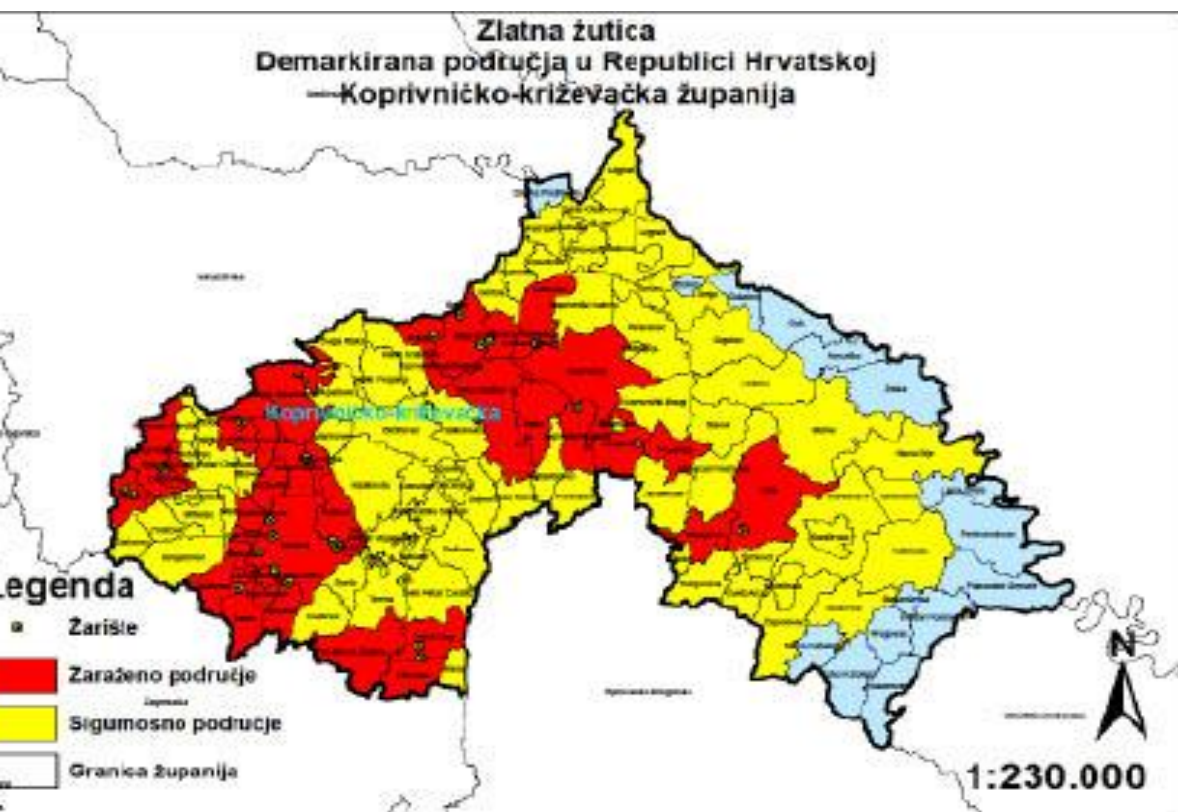
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
PPN	Štetni organizam	Djelatnik	ID pregleda	NUTS kod	Županija	Lokacija	Broj vizualnih pregleda	Datum pregleda	Mjesto pregleda	Pregledana površina (ha)	Pregledana količina (t)	Broj uzoraka	Tip uzorka	Predmet analize	Rezultat analize Pozitivan	Rezultat analize Negativan	Nadzirano bilje (vrste)	Opis uzorka	Katastarska općina	Katastarska čestica	Status područja	Koordinata E	Koordinata N

Results - demarcated areas

- demarcated areas maps generated from the records



Results - demarcated areas




Conclusions

- Efficient monitoring of all quarantine harmful organisms in the Republic of Croatia.
- MOBIDI PEST software solution is practical for use during visual inspections and sampling using mobile devices.
- Office administration allows real-time data viewing.



Some challenges

- Data on plant production areas are not in one single base
 - Forests?
 - Non-agricultural plants (distribution, numbers)?
 - Technical difficulties – blocking, loosing of data
-
- More looking at the smartphone than at plants and plan products!



Thank you for your attention!

www.hapih.hr



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