

**FRAMEWORK OF**

**THE COPEFA PESTICIDE MOBILE APPLICATION**



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# Essential Requirements

* Language preference and user sign-up
* Land registration for users based on location
* Registration of the user's land-based products
* Spraying instructions for pesticides
* Application registration for pesticides
* Control of the weather and alerts while using the application
* Potentially required unit translations when applying pesticides

# 

# Login and Opening Screen

On the first screen of the application, the user should be able to select a language. Each option in the language selection menu should be given in its language.

|  |
| --- |
| **English** |
| **Hrvatski** |
| **Türkçe** |
| **Română** |
| **Deutsch** |
| **Italiano** |

The application should guide the user to the recording menu after they've chosen a language. User-friendly registration options should not require extensive information.

**Please Register**

|  |  |
| --- | --- |
| **Name, Surname** | Writable field |
| **Country** | Options and “other” - writable field\* |
| **Occupation** | Options\*\* |
| **Education Level** | Writable field |
| **Email** | Writable field |
| **Username** | Writable field |
| **Password** | Writable field |
| **Retype Password** | Writable field |

\*Project partner countries should be listed as an option, and the new country should be written with the other option.

\*\* Farmers, agricultural employees, students, teachers, consultants, and other options should be given.

Education level and e-mail address should not be required. It should be noted that the e-mail address will be used to send project training documents and news.

# Land Registration Process

The application's registered user should be directed to the land registration menu. The user should be asked how they want to register the land in this menu. The menu should include options for location and land registration, as well as parcel number and land registration.

|  |
| --- |
| Register land using location |
| Register land by giving parcel number |

**Land registration using location:** If this option is chosen, the user's location should be accessible, and a land registration should be created for the area in which it is situated. The user should still be prompted to choose a name or number for the package during location registration. This registration must grant the user access to the parcel information.

**Registering a parcel of land by providing a number:** The user should be prompted to choose a name or number for the package when this menu option is chosen. This registration must grant the user access to the parcel information.

Following the creation of the land registration, the location of the registered land and the entry of the area information should be provided in both options. Following registration, the user should be directed to this menu. The user must specify the location of the land in the recording without location.

|  |  |
| --- | --- |
| **Location of the Land** | Writable field |
| **Area of Land** | Writable field\* |
| **Slope of the Land** | (%) Writable field |
| **Soil Structure** | \*\* |
| **Soil Texture** | \*\*\* |

\*Land area should be given in hectares (ha)

\*\* very thin, thin, medium, thick, very thick

\*\*\* sandy, silt, clay, loamy

# Product Registration Process

After completing the land registration process, the user should register products for each land. When registering the product, the first option should be to include six products (wheat, corn, grape, tomato, pepper, and apple) for which plant protection recommendations have been developed.

|  |  |  |
| --- | --- | --- |
| **Parcel** | **Product** | **Sowing/Planting Date** |
| **A** | Option and other writable fields\* | Writable field |
| **B** | Option and other writable fields\* | Writable field |
| **C** | Option and other writable fields\* | Writable field |
| **D** | Option and other writable fields\* | Writable field |
| **E** | Option and other writable fields\* | Writable field |
| **F** | Option and other writable fields\* | Writable field |

# Product Harvest Date Registration Process

The user should create a harvest date menu for the land and products they have registered with the application. Each product should have one or more harvest dates entered.

|  |  |  |
| --- | --- | --- |
| **Parcel** | **Product** | **Harvest Date** |
| **A** | Tomato | Writable field |
| **A** | Tomato | Writable field |
| **A** | Tomato | Writable field |
| **A** | Tomato | Writable field |
| **A** | Tomato | Writable field |
| **A** | Tomato | Writable field |

When the user enters the harvest date, the application should check the pesticide application records for the land, and if the number of days specified as PHI has not passed since the pesticide application, a warning should be displayed.

**"The minimum harvest period for this product has not been completed following the pesticide application on xx.xx.xxxx. Please reschedule harvest."**

# Pesticide Application Registration Process

When the user wants to create a pesticide application record, the user should be able to open the record of the agricultural parcel to be applied and enter the pesticide record.

If the products for which pesticide recommendations are given within the scope of the project are chosen for the parcel to be applied, the pesticide recommendations given in the attached excel files should be presented to the user in this section.

**Pesticide Registration Option 1**

For wheat, corn, grape, tomato, pepper, and apple products;

|  |  |
| --- | --- |
| **Parcel** | **A** |
| **Product** | **Wheat** |
| **Problem** | **Options - writable field\*** |
| **Pesticide** | **Options - writable field\*\*** |
| **Dose** | **Writable field** |
| **Application Date** | **Writable field** |
| **Harvest Interval (PHI)** | **Writable field (days)** |

\* For six products, the names of diseases or pests in the attached files should be presented as an option. Other options for entering problems should be provided in addition to these.

\*\* If the diseases or pests of the suggested products are chosen from the list, the user should be prompted to choose the pesticide to be used from the list in this option. The user should be able to select from the pesticides listed in the excel file if they so desire, and the system should be connected to the database that will be created. If the user chooses to enter the pesticide manually, the user must be able to type the pesticide name into the field.

**Pesticide Registration Option 2**

For other products;

|  |  |
| --- | --- |
| Parcel | A |
| Product | Writable field |
| Problem | Writable field |
| Pesticide | Writable field |
| Dose | Writable field |
| Application Date | Writable field |

## Weather Control

Following the registration of the pesticide application by the user, the application must receive data from a weather forecast provider application (AccuWeather, Google, etc.) to check the weather conditions for the location of the field to be sprayed and the date of spraying.

If one of the following scenarios is predicted for the location and date to be used, a warning should be issued for the relevant time zones.

*• Wind speeds of 10 km/h or higher*

*• Air temperature greater than 25 oC*

*• Humidity of 45% or less*

*Warning to be displayed;*

***Wind speed in your area between the hours of .... and …… 10 km/h and above.***

***The air temperature in your area is higher than 25 oC between the hours of .... and ….***

***Humidity in your area is below 45% between the hours of …. and .... In the case of pesticide application under these conditions, there is a risk of drift, dispersion and evaporation. This can lead to environmental pollution and reduce application efficiency.”***

*• Air temperature lower than 8 oC*

*Warning to be displayed;*

***“The air temperature in your area is less than 8 oC between the hours of …. and ....***

***In the case of pesticide application under these conditions, the application efficiency may decrease.”***

## Spraying Time Warning

If the spraying time is between April-October, spraying should be done in the evening. If the spraying date specified by the user is within these months, the application should display a warning as follows.

***“Spraying should be done in the evening. An earlier application of the spray could harm the crops, increase evaporation losses, and lessen the spray's effectiveness. Additionally, it harms non-target organisms, helpful insects, and pollinators, particularly bees.”***

If the spraying date specified by the user is between November and March, it should be done in the daylight. The application should show the following warning if the spraying date that the user specifies falls within these months.

***“Make sure the air temperature is not below 8 oC if the spraying is planned in the early morning or late evening when lower temperatures may occur.”***

## Repetitive Application Control

The user should check the prior records for the pesticide entered when creating a pesticide record for agricultural land to see if the same pesticide has been applied to the same parcel before.

The following warning should appear if the same pesticide is found to be being used.

*“****You applied the same pesticide on the dates xx.xx.XXXX and xx.xx.XXXX. Please proceed after verifying the maximum number of repeated applications of this pesticide that are permitted in your country.*** ***Repeated use of the same pesticides can result in the generation of resistant agents, a decrease in pesticide effectiveness, and an increase in environmental problems.”***

|  |
| --- |
| **It's been verified. Continue to the next step.** |

## Other Warnings

Following the completion of the login process by the user, some applications should be displayed and read by the user in order to adopt the basic principles of pesticide applications to the user. The following are the warnings that will be displayed.

***"Please check the pH level of the water you intend to spray. The pH of the water should be between 5.5 and 6.5. If the pH of the water you use is higher than this, use a pH lowering product."***

|  |
| --- |
| **It's been verified. Continue to the next step.** |

***"Please make the spraying mixture at the location that is closest to the land. Do not operate a vehicle while the tank is filled with a pesticide mixture. This may cause environmental pollution and the pesticide mixture to be dispersed.”***

|  |
| --- |
| **Continue to the next step.** |

***"After preparing the mixing mixture, do not keep it waiting." Begin the spraying as soon as possible. Waiting for the pesticide mixture may reduce its effectiveness, cause diseases and pests to develop resistance, and reduce application success."***

|  |
| --- |
| **Continue to the next step.** |

# Reporting

At the end of the production season or as needed, the user who has registered the land, crop, pesticide, and harvest dates in the application should be able to receive these as reports, download them, send them by e-mail, or access the printable version. The following is an example of a report format.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parcel** | **Product** | **Sowing Date** | **Pesticide Applications** | | | **Date of Harvest** |
| **Pesticide** | **Dose** | **Date of Spraying** |
| A | Tomato | 15.05.2022 | Spinosad | 50 ml/100 l | 25.05.2022 | 25.07.2022 |
| Mancozeb | 300gr/100 l | 30.05.2022 | 10.08.2022 |
|  |  |  | 30.08.2022 |
|  |  |  | 15.09.2022 |
|  |  |  | 30.09.2022 |
|  |  |  | 25.07.2022 |

# Unit Converts Addable in the Application

The user will find it simple to access the unit translations that are required by the application. The unit convert section of the application needs to be added for this. The following transfers any necessary unit converts.

**Area:**

The user should be able to convert between m2, decare and hectare.

**Volume:**

The user should be able to convert between millilitre and litre.

**Weight:**

The user should be able to convert between gr and kg.

**Dose:**

Dosage applications are generally given as kg/da, kg/ha, l/da, l/ha, and ml/100 l of water in pesticide licences. The user should rate the allowed dose to the user’s land area or the amount of spraying water to be used. A simple tool can be added to the application for this.

# Appendices

For each of the partner countries, licensed pesticide files in excel format are attached. For the products listed below, the in-question files contain licensed pesticides.

For the crops, the most prevalent diseases and pests were chosen, and approved pesticide application doses and pre-harvest interval times were provided.

• Wheat

• Sweetcorn

• Apple

• Grape

• Tomatoes

• Pepper

**Funded by the Erasmus+ Program of the European Union. However, European Commission cannot be held responsible for any use which may be made of the information contained therein.**